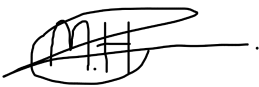



	<b>Scope Of Work</b>	<b>Generation</b>
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Title: <b>Refurbishment of Medium Voltage motors, as stock items on an “as and when” required basis for a period of five years for Kriel Power Station, Main Stores.</b>	Unique Identifier:	<b>555-EEP2149</b>
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<b>Compiled by</b>	<b>Functional Responsibility</b>	<b>Authorised by</b>
		
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Date: 01/10/2024	Date: 30/10/2024	Date: 01/11/2024

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## **1. INTRODUCTION**

Kriel Power Station is faced with unnecessary UCLF (Unavailability Capability Loss Factor) due to unavailability of spares, therefore, to mitigate this, a decision was made by the business to set up a spares supply and refurbishment contract as to ensure better control on the procurement and refurbishment of spares. The current refurbishment contract is about to expire, and the funds are depleting, hence the development of this SOW (scope of Work) to that effect.

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## **2. SUPPORTING CLAUSES**

### **2.1 SCOPE**

The RF motors spares listed in annexure 1 of this document, as stock items on an “as and when” required basis for a period of five years to Kriel Power Station, Main Stores.

#### **2.1.1 PURPOSE**

The purpose of the document is to provide a scope of work for the refurbishment and or replacement and delivery of medium voltage motors, as stock items on an “as and when” required basis for a period of five years to Kriel Power Station, Main Stores and intended to be the input to the NEC Part 3: Scope of Work.

#### **2.1.2 APPLICABILITY**

This document is applicable to Kriel Power Station, Maintenance, Electrical Engineering and Materials Management Department.

### **2.2 NORMATIVE/INFORMATIVE REFERENCES**

#### **2.2.1 NORMATIVE**

- [1] ISO 9000: Quality Management Systems
- [2] 240-55944466 Supplier Contract Quality Requirement’s Specification
- [3] QM 58 Supplier Contract Quality Requirements.
- [4] SANS 10242-1 The Rewinding and Refurbishing of Rotating Electrical Machines
- [5] 240-56361435 Transport of Power Station Electric Motors Standard (Rev 3)
- [6] 240-97049386 New MV Voltage Motors Procurement Standard

#### **2.2.2 INFORMATIVE**

Not applicable.

### **2.3 DEFINITIONS**

<b>Definitions</b>	<b>Description</b>
Spare	is the item required by Eskom and intended to be retained by Kriel at their main store as a backup component to the one in use at the plant
Specification	Is the technical description given by Eskom to describe the stock item required by the business

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### 2.3.1 DISCLOSURE CLASSIFICATION

**Controlled Disclosure:** Controlled Disclosure to external parties (either enforced by law, or discretionary).

### 2.4 ABBREVIATIONS

Abbreviations	Description
DD	Double Dip
DE	Drive End
EMD	Electrical Maintenance Department
MV	Medium Voltage
NDE	Non-Drive End
NEC	New Engineering Contract
OEM	Original Equipment Manufacture
QC	Quality Control
SWO	Scope Of Work
VPI	Vacuum Pressure Impregnation

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## **2.5 ROLES AND RESPONSIBILITIES**

Roles and responsibilities are as follows:

EMD Manager/End User

- Responsible in ensuring that the quality checking of the supplied spare is correct and useable prior to the item being binned.

Materials Manager

- Must ensure that the supplier is managed in line with this scope and the subsequent NEC document to be developed.

Maintenance Manager

- Must ensure plant availability and reliability through his/her oversight duties over the EMD Manager, End-user and Materials Management Manager

## **2.6 PROCESS FOR MONITORING**

Quality control on incoming product will be done and all material is to be signed off by the appointed QC personnel/Engineer/End user to ensure the quality of the supplied goods is according to standard.

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### **3. THE WORKS**

#### **3.1 BACKGROUND**

#### **3.2 DESCRIPTION OF THE WORKS**

The works entails to collect, dismantle, assess, repair, rewind, overhaul, assemble, paint, test, refurbishment, and supply of spare bearings as well as delivery of MV Motors on an “as-and-when required” basis for Kriel Power Station for the period of five years. The supplier must also provide technical support (including coming to site) on any issues related to MV motor bearings on an “as-and-when required basis”. All work performed should be in line with SANS 10242-1: The rewinding and refurbishing of rotating electrical machines Part 2: Medium-voltage three-phase induction motors. The motors are to be transported in line with 240-56361435 Transport of Power Station Electric Motors Standard. A high-level process flowchart is shown in section 3.5.

Kriel Power Station is situated approximately halfway between Bethal and Ogies on the R545, being just over 30 km from each town and 10 km north-west of Kriel Town.

The contractor is to notify Eskom when it becomes no longer viable to Repair, Rewind or Overhaul a motor, i.e., the cost of repair exceeds 70% of the cost of a new motor. The motors are to be replaced in line with 240-97049386 New Medium Voltage Motors Procurement Standard.

##### **3.2.1 BATTERY LIMITS**

N/A

##### **3.2.2 GENERAL REQUIREMENTS OF THE WORKS:**

The stock items will be supplied as per description/specification given by Eskom Kriel power station and the acceptance of the spare it will be against the set specification. Any ambiguity on the supplied specification will be clarified before the procurement of the spare by the supplier.

Failure to clarify will lead to the items not being accepted and not paid for by Eskom.

##### **3.2.3 SCOPE OF WORK DESCRIPTION**

- All the motors are to be cleaned properly. Shot blasting is preferred (no sandblasting or chemical cleaning).
- Removal of the windings is to be carried out strictly in accordance with SABS 0242-1 specifications.
- Method of varnishing to be DD and baked or VPI, unless otherwise called for Actuator Duty Cycles; to be approximately 1500 starts per hour and recommended class H.
- Paint work to be done as per SABS064 for the type of paint and the method of application.
- After painting of the motors is completed, the shafts should be treated for rust prevention. (Shaft journals are to be micro welded or new shafts are to be provided, according to SABS 0242) Metal spraying of shafts is not accepted.
- Two sets of Thermistors (i.e. 2 per phase = 6) are to be installed on all motors at all times where Thermistors were originally provided, and one set of Thermistors are to be installed on all actuator motors.

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- Terminal leads must be clearly marked and of a reasonable length to enable joints to be carried out.

### **3.2.3.1 ASSESSMENT**

Collect from Kriel Power station, strip, and clean, electrical test (stator and rotor), assess mechanical components, investigate, and make proposals to prevent future re-occurrence as well as determining the scope of work. Provide failure report in 5 working days after collection.

### **3.2.3.2 TESTING**

- Eskom reserves the right to inspect the motors or associated parts at any stage of maintenance, and to witness routine and performance tests. All tests should be conducted in line with SANS 10242-1.
- All motors are to be tested by the contractor prior to delivery, and test results are approved by the employer, based on meeting requirements. Eskom Quality Personnel, System Engineer, maintenance and vibration's analyst to witness the testing.
- Test certificates are required for all tests performed.
- Routine tests are performed on all repaired motors.
- Special tests are performed when specified by the employer.

### **3.2.3.3 MATERIALS**

<b>Bearings</b>	Only GB bearings, Glaceir, Howden, Renk and Michell bearings are to be used.
<b>Lubrication</b>	Shell Alvania, R2 and R3 ENGEN Premium 3
<b>Fans</b>	OEM unless otherwise specified.
<b>Heat exchanger</b>	OEM unless otherwise specified.
<b>Terminal boxes/blocks/connections</b>	OEM unless otherwise specified

### **3.2.4 DOCUMENTATION SUBMISSION AND RECORDING**

Equipment and Calibration or test certificates, user manuals and software associated with and are part of the item/spare purchase package will be provided as part of the supply of the spare in question.

### **3.3 PERFORMANCE GUARANTEES**

All guarantees and warranties that come as part of the sale will be passed on to Eskom even if the items or spares are not bought by Eskom directly from the OEM.

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### 3.4 STANDARDS, SPECIFICATIONS AND PROCEDURES

All material and equipment shall be new and of the standard and quality specified.

The design and manufacture of equipment shall be carried out and tested in accordance with the latest issue or amendments of the following Standards and Regulations, as applicable:

#### Relevant Standards and Codes

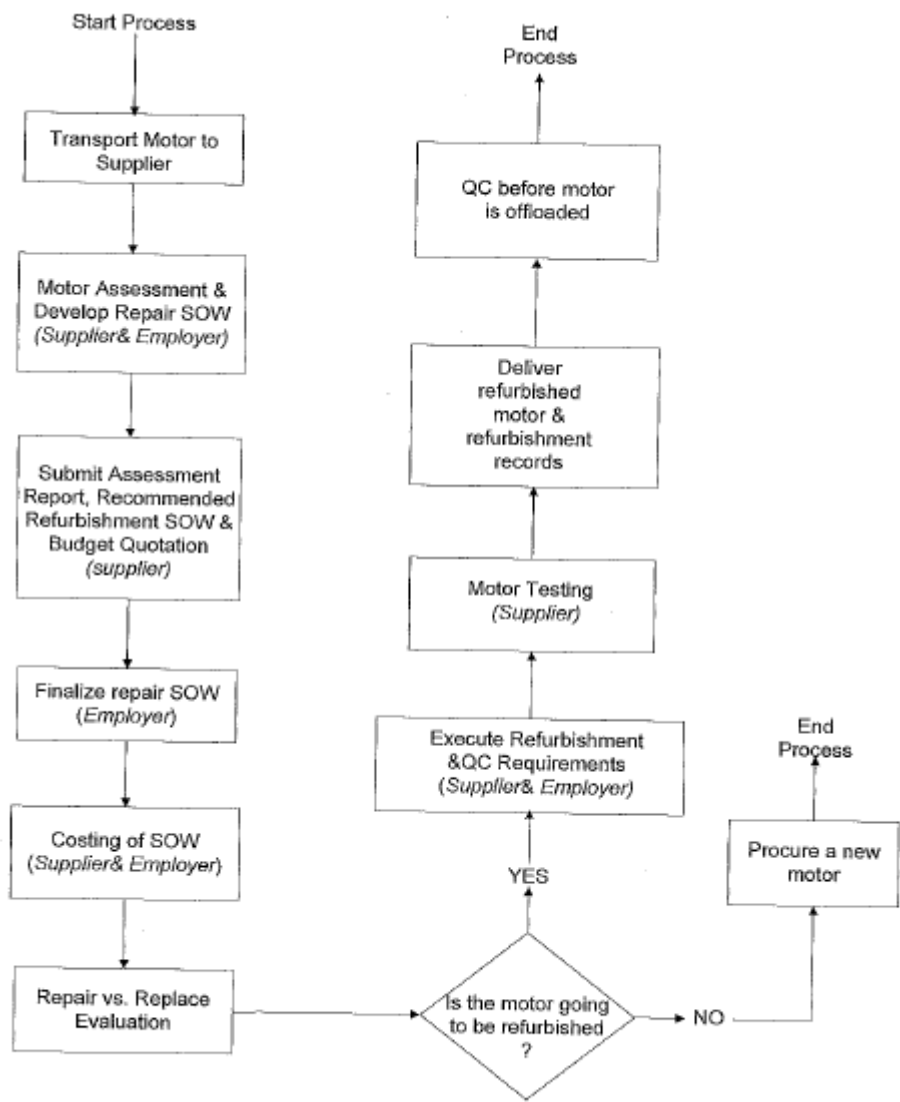
Document Number	Title
<b>Eskom Standards</b>	
240-55944466	Supplier Contract Quality Requirement's Specification
QM 58	Supplier Contract Quality Requirements
240-97049386	New Medium Voltage Motors Procurement Standard.
240-56361435	Transport of Power Station Electric Motors Standard
<b>General Standards</b>	
ISO 9001	Quality Management Systems.
SANS 10242-1	The Rewinding and Refurbishing of Rotating Electrical Machines

### 3.5 PROCESS FLOWCHART

The Contractor follows the following high-level process and the details in the Service Information.

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#### 4. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
Alex Nkadameng	EMD Supervisor
Kgosi Ntsheroa	EMD Manager
Mulatedzi Mugwena	Materials Management Manager
Lungile Gumbi	Maintenance Manager
Mhlengi Manqele	Electrical Engineer

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Marubini Manyage	Chief Engineer: Corp specialist
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## 5. REVISIONS

Date	Rev.	Compiler	Remarks
March 2024	0	M.H Manqele	Developed the SOW

## 6. DEVELOPMENT TEAM

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

1. Mhlengi Manqele
2. Alex Nkadimeng
3. Evah Malofha
4. Marubini Manyage

## 7. Annexure 1:

1.

<b>Motor Description:</b> Electric feed pump (EFP) motor: 141271	<b>Output Power (kW)</b> 10 000	<b>Voltage (V)</b> 11kV	<b>Current (A)</b> 601 A	<b>Speed (rpm)</b> 1492	<b>Weight</b> 35 Ton
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	52		5	
2	Dismantle, clean, test & assess all parts. Perform Non-Destructive Testing on the rotor shaft. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, El-Cid, Bar to bar continuity, core flux test, Tan delta testing	52		5	
3	Overhaul stator & spray with insulating varnish	52		5	
4	Overhaul rotor & spray with insulating varnish.	52		5	

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5	Polish DE&NDE bearings	52		5	
6	Re-metal bearing (price per bearing) 250mm GB bearing	104		10	
7	Replacement of bearing seals (Labyrinth seals on GB bearings)	208		20	
8	Replace oil ring (Price per ring)	10		5	
9	Re-metal bearing (price per bearing) 250mm Michelle bearing	104		10	
10	Replacement of bearing seals (felt seals on Michelle bearings)	208		20	
11	Clean and paint bearing housings - Price per housing	104		10	
12	Replace bearing insulation - Price per bearing	104		10	
13	Replacement of oil sight glasses to OEM standard (glass)	52		5	
14	Polish journals (price per journal)	104		10	
15	Polish Seal landing (price per seal landing)	104		10	
16	Overhaul & clean heat exchangers	52		5	
17	Repair heat exchanger	52		5	
18	Supply and fit new ZORC (11kVA)	52		5	
19	Supply and fit new terminal box and cover	52		5	
20	Supply and fit 1xheater box	52		5	
21	Supply and fit 2xforce feed pipes NDE	52		5	
22	Supply and fit 2xforce feed pipes DE	52		5	
23	Supply and fit 2x flow meters	52		10	
24	Micro-weld and machine DE &NDE bearing journals	52		10	
25	Supply new coupling	52		5	
25	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	52		5	
26	Rotor shaft run outs	52		5	
27	Bearing measurement verification- Blueing check sheet	52		5	
28	Pre-balance to show start mass	52		5	
29	Final balance with Eskom to show final mass	52		5	
30	Replacement of line side leads (price per lead)	52		5	
31	Replacement of star side leads (price per lead)	52		5	
32	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	52		5	
33	Polish stator feet	52		5	
34	Reassemble motor complete	52		5	
35	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (11kV) for the duration of the test	52		5	
36	Paint the motors light grey (gloss enamel G29)	52		5	
37	Fit the shaft locking device	52		5	

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38	Return the motor back to site (Kriel Power Station)	52		5	
Rewind					
39	Rewind stator	10		6	
40	Re-bar rotor	5		3	
41	New stator core	4		3	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

2.

<b>Motor Description: Forced Draught Fan(FD) motor: 141233</b>	<b>Output Power (kW) 3050</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 636 A</b>	<b>Speed (rpm) 741</b>	<b>Weight 20 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	32		2	
2	Dismantle, clean, test & assess all parts. Perform Non-Destructive Testing on the rotor shaft. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, El-Cid, Bar to bar continuity, core flux test	32		2	
3	Overhaul stator & spray with insulating varnish	32		2	
4	Overhaul rotor & spray with insulating varnish.	32		4	
5	Polish DE&NDE bearings	32		4	
6	Re-metal bearing (price per bearing) 225mm Renk bearing	64		12	
7	Replacement of bearing seals (Labyrinth seals on Renk bearings)	128		24	
8	Clean and paint bearing housings	64		12	
9	Replace bearing insulation (Price per bearing)	16		10	
10	Replacement of oil sight glasses to OEM standard (glass)	32		4	
11	Polish journals (Price per journal)	64		4	
12	Polish seal landings (Price per seal landing)	64		4	

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13	Overhaul & clean heat exchangers	32		4	
14	Repair heat exchanger	32		4	
15	Supply and fit new ZORC (3.3kVA)	64		4	
16	Supply and fit new terminal box and cover	64		4	
17	Supply and fit 1xheater box	32		4	
18	Supply and fit 2x flow meters	64		4	
19	Micro-weld and machine DE &NDE bearing journals	64		4	
20	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	32		4	
21	Rotor shaft run outs	32		4	
22	Bearing measurement verification- Blueing check sheet	32		4	
23	Pre-balance to show start mass	32		4	
24	Final balance with Eskom to show final mass	32		4	
25	Replacement of line side leads (price per lead)	32		4	
26	Replacement of star side leads (price per lead)	32		4	
27	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	32		4	
28	Reassemble motor	32		4	
29	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	32		4	
30	Paint the motors light grey (gloss enamel G29)	32		4	
31	Fit the shaft locking device	32		4	
32	Return the motor back to site (Kriel Power Station)	32		4	
Rewind					
33	Rewind stator	4		2	
34	Re-bar rotor	2		1	
35	New stator core	2		1	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

3.

<b>Motor Description:</b> <b>Induced Draught Fan(ID)</b> <b>Motor:</b> <b>141234</b>	<b>Output Power (kW)</b> <b>2500</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>538 A</b>	<b>Speed (rpm)</b> <b>597</b>	<b>Weight</b> <b>20 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	32		4	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, El-Cid, Bar to bar continuity, core flux test, Tan delta testing	32		4	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	32		4	
4	Overhaul stator & spray with insulating varnish	32		4	
5	Overhaul rotor & spray with insulating varnish.	32		4	
6	Polish DE&NDE bearings	64		12	
7	Re-metal bearing (price per bearing) 200mm Renk bearing	128		24	
8	Replacement of bearing seals (Labyrinth seals on Renk bearings)	128		12	
9	Clean and paint bearing housings	64		4	
10	Replace bearing insulation	64		10	
11	Replacement of oil sight glasses to OEM standard (glass)	32		4	
12	Polish journals (Price per journal)	32		4	
13	Polish seal landings (Price per seal landing)	32		4	
14	Overhaul and clean heat exchanger	32		4	
15	Repair heat exchanger	32		4	
16	Supply and fit new ZORC (3.3 kVA)	32		4	
17	Supply and fit new terminal box and cover	32		4	
18	Supply and fit 1xheater box	32		4	
19	Supply and fit 2x flow meters	32		4	
20	Micro-weld and machine DE &NDE bearing journals	32		4	
21	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	32		4	
22	Rotor shaft run outs	32		4	
23	Bearing measurement verification- Blueing check sheet	32		4	
24	Pre-balance to show start mass	32		4	
25	Final balance with Eskom to show final mass	32		4	
26	Replacement of line side leads (price per lead)	32		4	
27	Replacement of star side leads (price per lead)	32		4	

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28	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	32		4	
29	Reassemble motor	32		4	
30	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	32		4	
31	Paint the motors light grey (gloss enamel G29)	32		4	
32	Fit the shaft locking device	32		4	
33	Return the motor back to site (Kriel Power Station)	32		4	
Rewind					
34	Rewind stator	4		2	
35	Re-bar rotor	2		1	
36	New stator core	2		1	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

4.

<b>Motor Description:</b> <b>PA fan (U1-3)</b> <b>Motor:</b> <b>179099</b>	<b>Output Power (kW)</b> <b>465</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>98 A</b>	<b>Speed (rpm)</b> <b>1492</b>	<b>Weight</b> <b>4.5 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	84		12	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	84		12	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	84		12	
4	Overhaul stator & spray with insulating varnish	84		12	
5	Overhaul rotor & spray with insulating varnish.	84		12	
6	Polish DE&NDE bearings	84		12	
7	Re-metal bearing (price per bearing) 110mm GB bearing	168		24	
8	Replacement of bearing seals (Labyrinth seals on GB bearings)	336		48	
9	Clean and paint bearing housings	168		24	

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10	Replace bearing insulation	168		6	
11	Replacement of all oil sight glasses to OEM standard (glass)	168		12	
12	Polish journals (Price per journal)	168		24	
13	Polish seal landings (Price per seal landing	168		24	
14	Overhaul & clean heat exchangers	84		12	
15	Repair heat exchanger	84		12	
16	Supply and fit new ZORC (3.3 kVA)	84		12	
17	Supply and fit new terminal box and cover	84		12	
18	Supply and fit 1xheater box	84		12	
19	Supply and fit 2x flow meters	84		12	
20	Micro-weld and machine DE &NDE bearing journals	84		12	
21	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	84		12	
22	Rotor shaft run outs	84		12	
23	Bearing measurement verification- Blueing check sheet	84		12	
24	Pre-balance to show start mass	84		12	
25	Final balance with Eskom to show final mass	84		12	
26	Replacement of line side leads (price per lead)	84		12	
27	Replacement of star side leads (price per lead)	84		12	
28	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	84		12	
29	Polish stator feet	84		12	
30	Reassemble motor	84		12	
31	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	84		12	
32	Paint the motors light grey (gloss enamel G29)	84		12	
33	Fit the shaft locking device	84		12	
35	Return the motor back to site (Kriel Power Station)	84		12	
Rewind					
36	Rewind stator	10		6	
37	Re-bar rotor	6		4	
38	New stator core	4		2	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

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5.

<b>Motor Description:</b> <b>PA fan (U4-6)</b> <b>Motor:</b> <b>179096</b>	<b>Output Power (kW)</b> <b>650</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>113 A</b>	<b>Speed (rpm)</b> <b>1488</b>	<b>Weight</b> <b>5 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	64		10	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	64		10	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	64		10	
4	Overhaul stator & spray with insulating varnish	64		10	
5	Overhaul rotor & spray with insulating varnish.	64		10	
6	Polish DE&NDE bearings	64		10	
7	Re-metal bearing (price per bearing) 100mm GB bearing	64		10	
8	Replacement of bearing seals (Labyrinth seals)	256		30	
9	Re-metal bearing (price per bearing) 4 inch Glacier bearing	64		10	
10	Install new oil scoop kits	20		12	
11	Clean and paint bearing housings	128		20	
12	Replace bearing insulation	64		10	
13	Replacement of all oil sight glasses to OEM standard (glass)	64		10	
14	Polish journals and seal landings	64		10	
15	Overhaul & clean heat exchangers	64		10	
16	Repair heat exchanger	64		10	
17	Supply and fit new ZORC (3.3 kVA)	64		10	
18	Supply and fit new terminal box and cover	64		10	
19	Supply and fit 1xheater box	64		10	
20	Supply and fit 2x flow meters	64		10	
21	Micro-weld and machine DE &NDE bearing journals	64		10	
22	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	64		10	
23	Rotor shaft run outs	64		10	

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24	Bearing measurement verification- Blueing check sheet	64		10	
25	Pre-balance to show start mass	64		10	
26	Final balance with Eskom to show final mass	64		10	
27	Replacement of line side leads (price per lead)	64		10	
28	Replacement of star side leads (price per lead)	64		10	
29	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	64		10	
30	Polish stator feet	64		10	
31	Reassemble motor complete	64		10	
32	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	64		10	
33	Paint the motors light grey (gloss enamel G29)	64		10	
34	Fit the shaft locking device	64		10	
35	Return the motor back to site (Kriel Power Station)	64		10	
Rewind					
36	Rewind stator	8		6	
37	Re-bar rotor	4		4	
38	New stator core	2		2	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

6.

<b>Motor Description:</b> <b>Mill (U1-3)</b> <b>Motor:</b> <b>141218</b>	<b>Output Power (kW)</b> <b>328</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>74 A</b>	<b>Speed (rpm)</b> <b>938</b>	<b>Weight</b> <b>4.5 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	124		12	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	124		12	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	124		12	
4	Overhaul stator & spray with insulating varnish	124		12	

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5	Overhaul rotor & spray with insulating varnish.	124		12	
6	Polish DE&NDE bearings	124		12	
7	Re-metal bearing (price per bearing) 110mm GB bearing	248		24	
8	Replacement of bearing seals (Labyrinth seals)	496		48	
9	Re-metal bearing (price per bearing) 4½ inch Glacier bearing	248		24	
10	Install new oil scoop kits	20		12	
11	Clean and paint bearing housings	248		12	
12	Replace bearing insulation	248		24	
13	Replacement of oil sight glasses to OEM standard (glass)	248		24	
14	Polish journals and seal landings	124		12	
15	Overhaul & clean heat exchangers	124		12	
16	Repair heat exchanger	124			
17	Supply and fit new ZORC (11kVA)	124		12	
18	Supply and fit new terminal box and cover	124		12	
19	Supply and fit 1xheater box	124		12	
20	Supply and fit 2x flow meters	124		12	
21	Micro-weld and machine DE &NDE bearing journals	124		12	
22	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	124		12	
23	Rotor shaft run outs	124		12	
24	Bearing measurement verification- Blueing check sheet	124		12	
25	Pre-balance to show start mass	124		12	
26	Final balance with Eskom to show final mass	124		12	
27	Replacement of line side leads (price per lead)	124		12	
28	Replacement of star side leads (price per lead)	124		12	
29	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	124		12	
30	Polish stator feet	124		12	
31	Reassemble motor complete	124		12	
32	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test.	124		12	
33	Paint the motors light grey (gloss enamel G29)	124		12	
34	Fit the shaft locking device	124		12	
35	Return the motor back to site (Kriel Power Station)	124		12	
Rewind					
36	Rewind stator	12		6	
37	Re-bar rotor	6		4	
38	New stator core	4		2	
Total					

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Lead time to execute abovementioned Scope of Work (Weeks)				
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7.

<b>Motor Description:</b> <b>Mill (U4-6)</b> <b>Motor:</b> <b>179095</b>	<b>Output Power (kW)</b> <b>570</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>130 A</b>	<b>Speed (rpm)</b> <b>986</b>	<b>Weight</b> <b>5.5 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	64		12	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	64		12	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	64		12	
4	Overhaul stator & spray with insulating varnish	64		12	
5	Overhaul rotor & spray with insulating varnish.	64		12	
6	Polish DE&NDE bearings	64		12	
7	Re-metal bearing (price per bearing) 140mm GB bearing	128		10	
8	Replacement of bearing seals (Labyrinth seals)	128		48	
9	Re-metal bearing (price per bearing) 5 inch Glacier bearing	128		10	
10	Install new oil scoop kits	64		12	
11	Clean and paint bearing housings	64		12	
12	Replace bearing insulation	128		8	
13	Replacement of oil sight glasses to OEM standard (glass)	64		12	
14	Polish journals and seal landings	64		12	
15	Overhaul & clean heat exchangers	64		12	
16	Repair heat exchanger	64		12	
17	Supply and fit new ZORC (3.3 kVA)	64		12	
18	Supply and fit new terminal box and cover	64		12	
19	Supply and fit 1xheater box	64		12	
20	Supply and fit 2x flow meters	64		12	
21	Micro-weld and machine DE &NDE bearing journals	64		12	

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22	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	64		12	
23	Rotor shaft run outs	64		12	
24	Bearing measurement verification- Blueing check sheet	64		12	
25	Pre-balance to show start mass	64		12	
26	Final balance with Eskom to show final mass	64		12	
27	Replacement of line side leads (price per lead)	30		12	
28	Replacement of star side leads (price per lead)	30		12	
29	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	64		12	
30	Polish stator feet	64		12	
31	Reassemble motor complete	64		12	
32	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	64		12	
33	Paint the motors light grey (gloss enamel G29)	64		12	
34	Fit the shaft locking device	64		12	
35	Return the motor back to site (Kriel Power Station)	64		12	
Rewind					
36	Rewind stator	12		6	
37	Re-bar rotor	8		4	
38	New stator core	4		2	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

8.

<b>Motor Description: Condensate Extraction Pump (CEP) motor: Vertical: 179098</b>	<b>Output Power (kW) 1500</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 310 A</b>	<b>Speed (rpm) 1488</b>	<b>Weight 6 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				

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1	Collect motor from Kriel Power Station	68		10	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	68		10	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	68		10	
4	Overhaul stator & spray with insulating varnish	68		10	
5	Overhaul rotor & spray with insulating varnish	68		10	
6	Polish NDE guide bearing	30		8	
7	Polish thrust pads	30		8	
8	Re-metal 110mm Federal Mogul thrust & guide bearing	30		8	
9	Polish DE bearing journal	30		8	
10	Replace NDE bearing - SKF 7324 angular contact bearing	40		6	
11	Replace DE bearing - SKF 6330 deep groove ball bearing	40		6	
12	Clean, overhaul and paint bearing housings	68		10	
13	Pressure test bearing cooler	68		10	
14	Overhaul & clean bearing cooler	68		10	
15	Supply new bearing cooler	68		10	
16	Supply and fit new ZORC (3.3 kVA)	68		10	
17	Supply and fit new terminal box and cover	68		10	
18	Supply and fit 1xheater box	68		10	
19	Supply and fit 2x flow meters	68		10	
20	Micro-weld and machine DE &NDE bearing journals	68		10	
21	Supply new coupling	68		10	
22	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	68		10	
23	Rotor shaft run outs	68		10	
24	Bearing measurement verification- Blueing check sheet	68		10	
25	Pre-balance to show start mass	68		10	
26	Final balance with Eskom to show final mass	68		10	
27	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	68		10	
28	Polish stator feet and conduct concentricity tests	68		10	
29	Reassemble motor	68		10	
30	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	68		10	

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31	Trim balance the rotor	68		10	
32	Paint the motors light grey (gloss enamel G29)	68		10	
33	Fit the shaft locking device	68		10	
34	Return the motor back to site (Kriel Power Station)	68		10	
Rewind					
35	Rewind stator	10		6	
36	Re-bar rotor	6		4	
37	New stator core	4		2	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

9.

<b>Motor Description:</b> Cooling water (CW) pump motor: vertical: 179097	<b>Output Power (kW)</b> 1500	<b>Voltage (V)</b> 3.3 kV	<b>Current (A)</b> 340 A	<b>Speed (rpm)</b> 330	<b>Weight</b> 20 Ton
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	30		6	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, El-Cid, Bar to bar continuity, core flux test, Tan delta testing	30		6	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	30		6	
4	Overhaul stator & spray with insulating varnish	30		6	
5	Overhaul rotor & spray with insulating varnish.	30		6	
6	Polish NDE bearing	30		6	
7	Polish thrust pads	30		6	
8	Polish NDE bearing journal	30		6	
9	Clean, overhaul and paint NDE bearing housing	30		6	
10	Polish DE bearing	30		6	
11	Polish DE bearing journal	30		6	
12	Clean, overhaul and paint DE bearing housing	30		6	
13	Pressure test bearing cooler	30		6	
14	Overhaul & clean bearing cooler	30		6	

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15	Supply new bearing cooler	30			
16	Supply and fit new ZORC (3.3 kVA)	30		6	
17	Supply and fit new terminal box and cover	30		6	
18	Supply and fit 1xheater box	30		6	
19	Supply and fit 2x flow meters	30		6	
20	Micro-weld and machine DE &NDE bearing journals	30		6	
21	Supply new coupling	30		6	
22	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	30		6	
23	Rotor shaft run outs	30		6	
24	Bearing measurement verification- Blueing check sheet	30		6	
25	Pre-balance to show start mass	30		6	
26	Final balance with Eskom to show final mass	30		6	
27	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	30		6	
28	Polish stator feet and conduct concentricity tests	30		6	
29	Reassemble motor	30		6	
30	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	30		6	
31	Trim balance the rotor	30		6	
32	Paint the motors light grey (gloss enamel G29)	30		6	
33	Fit the shaft locking device	30		6	
34	Return the motor back to site (Kriel Power Station)	30		6	
<b>Rewind</b>					
35	Rewind stator	6		4	
36	Re-bar rotor	4		2	
37	New stator core	2		2	
<b>Total</b>					
<b>Lead time to execute abovementioned Scope of Work (Weeks)</b>					

10.

<b>Motor Description: Ash pump motor: 217674</b>	<b>Output Power (kW) 420</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 87 A</b>	<b>Speed (rpm) 1481</b>	<b>Weight 3 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	88		20	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	88		20	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	88		20	
4	Polish stator feet	88		20	
5	Overhaul stator & spray with insulating varnish	88		20	
6	Overhaul rotor & spray with insulating varnish	88		20	
7	Supply and fit new DE and NDE "V" Seals (V90)	88		20	
8	Supply and fit DE bearings-NU219 & 6219 C3	88		20	
9	Supply and fit NDE bearing NU219 C3	88		20	
10	Supply and fit new ZORC (3.3 kVA)	88		20	
11	Supply and fit new terminal box and cover	88		20	
12	Supply and fit 1xheater box	88		20	
13	Supply new fan and fan cover	88		20	
14	Micro-weld and machine DE &NDE bearing journals	88		20	
15	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	88		20	
16	Rotor shaft run outs	88		20	
17	Bearing measurement verification- Blueing check sheet	88		20	
18	Pre-balance to show start mass	88		20	
19	Final balance with Eskom to show final mass	88		20	
20	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	88		20	
21	Reassemble motor	88		20	
22	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	88		20	
23	Paint the motors light grey (gloss enamel G29)	88		20	
24	Fit the shaft locking device	88		20	
25	Return the motor back to site (Kriel Power Station)	88		20	
Rewind					
26	Rewind stator	15		10	
27	Re-bar rotor	10		4	
28	New stator core	6		2	

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Total				
Lead time to execute abovementioned Scope of Work (Weeks)				

11.

<b>Motor Description:</b> <b>Sluice pump motor:</b> <b>141279</b>	<b>Output Power (kW)</b> <b>300</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>63 A</b>	<b>Speed (rpm)</b> <b>1477</b>	<b>Weight</b> <b>3 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	48		20	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	48		20	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	48		20	
4	Polish stator feet	48		20	
5	Overhaul stator & spray with insulating varnish	48		20	
6	Overhaul rotor & spray with insulating varnish	48		20	
7	Supply DE and NDE "V" Seals (V100)	48		20	
8	Supply and fit DE bearings- NU 322 C3	48		20	
9	Supply and fit NDE bearing 6219 C3	48		20	
10	Supply and fit new ZORC (3.3 kVA)	48		20	
11	Supply and fit new terminal box and cover	48		20	
12	Supply and fit 1xheater box	48		20	
13	Supply new fan and fan cover	48		20	
14	Micro-weld and machine DE &NDE bearing journals	48		20	
15	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	48		20	
16	Rotor shaft run outs	48		20	
17	Bearing measurement verification- Blueing check sheet	48		20	
18	Pre-balance to show start mass	48		20	
19	Final balance with Eskom to show final mass	48		20	

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20	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	48		20	
21	Reassemble motor	48		20	
22	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	48		20	
23	Paint the motors light grey (gloss enamel G29)	48		20	
24	Fit the shaft locking device	48		20	
25	Return the motor back to site (Kriel Power Station)	48		20	
Rewind					
26	Rewind stator	10		8	
27	Re-bar rotor	6		4	
28	New stator core	4		2	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

12.

<b>Motor Description: Centac Compressor motor: 501009</b>	<b>Output Power (kW) 530</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 109 A</b>	<b>Speed (rpm) 2969</b>	<b>Weight 3 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	6		3	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	6		3	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	6		3	
4	Overhaul stator & spray with insulating varnish	6		3	
5	Overhaul rotor & spray with insulating varnish.	6		3	
6	Re-metal 80mm Glacier bearings	6		3	
7	Replacement of motor bearing seals (Labyrinth seals)	24		12	

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8	Supply new breathers and sight glasses	6		3	
9	Overhaul & clean heat exchangers	6		3	
10	Supply and fit new ZORC (3.3 kVA)	6		3	
11	Supply and fit new terminal box and cover	6		3	
12	Supply and fit 1xheater box	6		3	
13	Supply and fit 2x flow meters	6		3	
14	Micro-weld and machine DE &NDE bearing journals	6		3	
15	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	6		3	
16	Rotor shaft run outs	6		3	
17	Bearing measurement verification- Blueing check sheet	6		3	
18	Pre-balance to show start mass	6		3	
19	Final balance with Eskom to show final mass	6		3	
20	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	6		3	
21	Reassemble motor	6		3	
22	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test.	6		3	
23	Paint the motors light grey (gloss enamel G29)	6		3	
24	Fit the shaft locking device	6		3	
25	Return the motor back to site (Kriel Power Station)	6		3	
Rewind					
26	Rewind stator	3		2	
27	Re-bar rotor	2		1	
28	New stator core	1		1	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

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13.

<b>Motor Description: Demag Compressor motor: 500980</b>	<b>Output Power (kW) 650</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 136 A</b>	<b>Speed (rpm) 2955</b>	<b>Weight 3.5 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	6		3	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	6		3	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	6		3	
4	Overhaul stator & spray with insulating varnish	6		3	
5	Overhaul rotor & spray with insulating varnish.	6		3	
6	Re-metal 80mm Glacier bearings	6		3	
7	Replacement of motor bearing seals (Labyrinth seals) - 100mm	24		12	
8	Supply new breathers and sight glasses	6		3	
9	Supply and fit new ZORC (3.3 kVA)	6		3	
10	Supply and fit new terminal box and cover	6		3	
11	Supply and fit 1xheater box	6		3	
12	Supply and fit 2x flow meters	6		3	
13	Micro-weld and machine DE &NDE bearing journals	6		3	
14	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	6		3	
15	Rotor shaft run outs	6		3	
16	Bearing measurement verification- Blueing check sheet	6		3	
17	Pre-balance to show start mass	6		3	
18	Final balance with Eskom to show final mass	6		3	
19	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	6		3	

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20	Reassemble motor	6		3	
13	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	6		3	
14	Paint the motors light grey (gloss enamel G29)	6		3	
15	Fit the shaft locking device	6		3	
16	Return the motor back to site (Kriel Power Station)	6		3	
Rewind					
27	Rewind stator	3		2	
28	Re-bar rotor	2		1	
29	New stator core	1		1	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

14.

<b>Motor Description: Cameron Compressor motor: 664141</b>	<b>Output Power (kW) 510</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 102 A</b>	<b>Speed (rpm) 2969</b>	<b>Weight 3 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	20		10	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	20		10	
3	Perform NDT on the rotor shaft and provide feedback on the condition of the motor	20		10	
4	Overhaul stator & spray with insulating varnish	20		10	
5	Overhaul rotor & spray with insulating varnish	20		10	
6	Re-metal 80mm Glacier bearings	20		10	
7	Replacement of motor bearing seals (Labyrinth seals)	80		40	
8	Supply new breather and sight glasses	20		10	

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9	Supply and fit new ZORC (3.3 kVA)	20		10	
10	Supply and fit new terminal box and cover	20		10	
11	Supply and fit 1xheater box	20		10	
12	Supply and fit 2x flow meters	20		10	
13	Micro-weld and machine DE &NDE bearing journals	20		10	
14	Dynamically balance the rotor at operating speed according to ISO 1940/01 Balancing grade G6.3 (balancing certificate to be included in test report)	20		10	
15	Rotor shaft run outs	20		10	
16	Bearing measurement verification- Blueing check sheet	20		10	
17	Pre-balance to show start mass	20		10	
18	Final balance with Eskom to show final mass	20		10	
19	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	20		10	
20	Re-assemble motor	20		10	
21	Test run the motor in the presence of an Eskom representative and submit report. Motor to be at full voltage (3.3kV) for the duration of the test	20		10	
22	Paint the motor light grey (gloss enamel G29)	20		10	
23	Fit the shaft locking device	20		10	
24	Return the motor back to site (Kriel Power Station)	20		10	
<b>Rewind</b>					
25	Rewind stator	6		5	
26	Re-bar rotor	3		3	
27	New stator core	2		2	
<b>Total</b>					
Lead time to execute abovementioned Scope of Work (Weeks)					

15.

<b>Motor Description:</b> <b>HP Demin motor:</b> <b>614532</b>	<b>Output Power (kW)</b> <b>160</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>36 A</b>	<b>Speed (rpm)</b> <b>1484</b>	<b>Weight</b> <b>2 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				

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1	Collect motor from Kriel Power Station	10		4	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	10		4	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	10		4	
4	Overhaul stator & spray with insulating varnish	10		4	
5	Overhaul rotor & spray with insulating varnish.	10		4	
6	Supply DE and NDE "V" Seals (V90)	10		4	
7	Supply and fit DE bearings - 6320 C3	10		4	
8	Supply and fit NDE bearing - 6316 C3	10		4	
9	Supply and fit new ZORC (3.3 kVA)	10		4	
10	Supply and fit new terminal box and cover	10		4	
11	Supply and fit 1xheater box	10		4	
12	Supply and fit 2x flow meters	10		4	
13	Supply new fan and fan cover	10		4	
14	Micro-weld and machine DE &NDE bearing journals	10		4	
15	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	10		4	
16	Rotor shaft run outs	10		4	
17	Bearing measurement verification- Blueing check sheet	10		4	
18	Pre-balance to show start mass	10		4	
19	Final balance with Eskom to show final mass	10		4	
20	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	10		4	
21	Reassemble motor	10		4	
22	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	10		4	
23	Paint the motors light grey (gloss enamel G29)	10		4	
24	Fit the shaft locking device	10		4	
25	Return the motor back to site (Kriel Power Station)	10		4	
Rewind					
26	Rewind stator	3		3	
27	Re-bar rotor	1		1	
28	New stator core	1		1	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

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16.

<b>Motor Description: Ash water return (small) motor: 141329</b>	<b>Output Power (kW) 300</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 55 A</b>	<b>Speed (rpm) 1484</b>	<b>Weight 2.5 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	10		3	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	10		3	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	10		3	
4	Polish stator feet	10		3	
5	Overhaul stator & spray with insulating varnish	10		3	
6	Overhaul rotor & spray with insulating varnish	10		3	
7	Supply DE and NDE "V" Seals	10		3	
8	Supply and fit DE bearings - NU 322	10		3	
9	Supply and fit NDE bearing - 6318	10		3	
10	Re-sleeve DE bearing housing	10		3	
11	Re-sleeve NDE bearing housing	10		3	
12	Supply and fit new ZORC (3.3 kVA)	10		3	
13	Supply and fit new terminal box and cover	10		3	
14	Supply and fit 1xheater box	10		3	
15	Supply and fit 2x flow meters	10		3	
16	Supply new fan and fan cover	10		3	
17	Micro-weld and machine DE &NDE bearing journals	10		3	
18	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	10		3	
19	Rotor shaft run outs	10		3	
20	Bearing measurement verification- Blueing check sheet	10		3	
21	Pre-balance to show start mass	10		3	

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22	Final balance with Eskom to show final mass	10		3	
23	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	10		3	
24	Replace all grease pipes and fittings	10		3	
25	Reassemble motor	10		3	
26	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	10		3	
27	Paint the motors light grey (gloss enamel G29)	10		3	
28	Fit the shaft locking device	10		3	
29	Return the motor back to site (Kriel Power Station)	10		3	
<b>Rewind</b>					
30	Rewind stator	4		3	
31	Re-bar rotor	2		2	
32	New stator core	1		1	
<b>Total</b>					
Lead time to execute abovementioned Scope of Work (Weeks)					

17.

<b>Motor Description:</b> <b>Ash water return (Big) motor:</b> <b>587373</b>	<b>Output Power (kW)</b> <b>485</b>	<b>Voltage (V)</b> <b>3.3 kV</b>	<b>Current (A)</b> <b>105 A</b>	<b>Speed (rpm)</b> <b>1488</b>	<b>Weight</b> <b>2.5 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	<b>Basic overhaul</b>				
1	Collect motor from Kriel Power Station	10		3	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	10		3	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	10		3	
4	Polish stator feet	10		3	
5	Overhaul stator & spray with insulating varnish	10		3	

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6	Overhaul rotor & spray with insulating varnish	10		3	
7	Supply DE and NDE "V" Seals	10		3	
8	Supply and fit DE bearings -NU 322	10		3	
9	Supply and fit NDE bearing - 6322	10		3	
10	Re-sleeve DE bearing housing	10		3	
11	Re-sleeve NDE bearing housing	10		3	
12	Supply and fit new ZORC (3.3 kVA)	10		3	
13	Supply and fit new terminal box and cover	10		3	
14	Supply and fit 1xheater box	10		3	
15	Supply and fit 2x flow meters	10		3	
16	Supply new fan and fan cover	10		3	
17	Micro-weld and machine DE &NDE bearing journals	10		3	
18	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	10		3	
19	Rotor shaft run outs	10		3	
20	Bearing measurement verification- Blueing check sheet	10		3	
21	Pre-balance to show start mass	10		3	
22	Final balance with Eskom to show final mass	10		3	
23	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	10		3	
24	Replace all grease pipes and fittings	10		3	
25	Reassemble motor	10		3	
26	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test	10		3	
27	Paint the motors light grey (gloss enamel G29)	10		3	
28	Fit the shaft locking device	10		3	
29	Return the motor back to site (Kriel Power Station)	10		3	
Rewind					
30	Rewind stator	5		3	
31	Re-bar rotor	2		2	
32	New stator core	1		1	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

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18.

<b>Motor Description: Electric Mulsifier pump motor: 141205</b>	<b>Output Power (kW) 261</b>	<b>Voltage (V) 3.3 kV</b>	<b>Current (A) 45 A</b>	<b>Speed (rpm) 1480</b>	<b>Weight 2 Ton</b>
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No.	Description	Estimated Quantity	Rate	Breakdown	Rate
	Basic overhaul				
1	Collect motor from Kriel Power Station	6		2	
2	Dismantle, clean, test & assess all parts. Provide Kriel with a QCP. Tests should include, as a minimum: IR, PI, Winding Resistance, El-Cid, Bar to bar continuity, core flux test	6		2	
3	Perform Non-Destructive Testing on the rotor shaft and provide feedback on the condition of the motor.	6		2	
4	Polish stator feet	6		2	
5	Overhaul stator & spray with insulating varnish	6		2	
6	Overhaul rotor & spray with insulating varnish	6		2	
7	Supply DE and NDE "V" Seals	6		2	
8	Supply and fit DE bearings - NU220 EM1 C3	6		2	
9	Supply and fit NDE bearing - 6220 C3	6		2	
10	Re-sleeve DE bearing housing	6		2	
11	Re-sleeve NDE bearing housing	6		2	
12	Overhaul & clean heat exchangers	6		2	
13	Supply and fit new ZORC (3.3 kVA)	6		2	
14	Supply and fit new terminal box and cover	6		2	
15	Supply and fit 1xheater box	6		2	
16	Supply and fit 2x flow meters	6		2	
17	Supply new fan and fan cover	6		2	
18	Micro-weld and machine DE &NDE bearing journals	6		2	
19	Dynamically balance the rotor at operating speed according to ISO 1940/1 balancing grade G6.3 (Balancing certificate to be included in test report).	6		2	
20	Rotor shaft run outs	6		2	

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21	Bearing measurement verification- Blueing check sheet	6		2	
22	Pre-balance to show start mass	6		2	
23	Final balance with Eskom to show final mass	6		2	
24	Replace all the rubber seals and gaskets, including refurbishment of terminal boxes	6		2	
25	Replace all grease pipes and fittings	6		2	
26	Reassemble motor	6		2	
27	Test run the motors in the presence of an Eskom representative and submit a report. Motor to be at full Voltage (3.3kV) for the duration of the test.	6		2	
28	Paint the motors light grey (gloss enamel G29)	6		2	
29	Fit the shaft locking device	6		2	
30	Return the motor back to site (Kriel Power Station)	6			
Rewind					
31	Rewind stator	2		1	
32	Re-bar rotor	1		1	
33	New stator core	1		1	
Total					
Lead time to execute abovementioned Scope of Work (Weeks)					

## 8. Annexure 2: List of MV motor bearings as stock items

The service provider must be able to provide technical support relating to MV motor bearings (including coming to site) and also to supply and deliver new bearings to Kriel power station.

**Please note: Where applicable Kriel Power Station will free issue the new bearing to the supplier whereby the supplier will not cost Kriel Power Station for the new bearing issued.**

	Bearings	Stock Number	Quantity
1	BEARING, SLEEVE: TYPE: MILL MOTOR; INSIDE DIAMETER: 127 MM; OUTSIDE DIAMETER: 157 MM; LENGTH: 127 MM; MATERIAL: WHITE METAL; SIZE: 5; SUPPLIER NOTE:	34061	30
2	BEARING, SLEEVE: TYPE: MILL MOTOR; INSIDE DIAMETER: 110 MM; MATERIAL: WHITE METAL; FOR USE ON 328 KW MOTOR; UNIT 1TO 3; NDE/DE;	251388	30
3	BEARING, SLEEVE: TYPE: JOURNAL; INSIDE DIAMETER: 140 MM;OUTSIDE DIAMETER: 274 MM; LENGTH: 105 MM; MATERIAL: WHITE METAL;APPLICATION: USED ON THE HORIZONTAL BEARING ASSEMBLY ON NEW U4-6 MILL MOTOR; DRAWING NO: BP11611; PART NO:HRS14/EARP140/SS160/SB140/I; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY	588610	30

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	ARE PERFORMING AGAINST THE CORRECT DRAWING		
4	BEARING, SLEEVE: TYPE: PA FAN MOTOR; INSIDE DIAMETER: 114 MM; OUTSIDE DIAMETER: 155 MM; LENGTH: 127 MM; MATERIAL: WHITE METAL; SIZE: 4.5 IN; MOTOR JKD 400/6, 465 KW, 3,3 KV, LM2556/04,	33554	25
5	BEARING, SLEEVE: TYPE: JOURNAL; INSIDE DIAMETER: 100 MM; OUTSIDE DIAMETER: 209 MM; LENGTH: 80 MM; MATERIAL: WHITE METAL; SIZE: 4	588609	20
6	BEARING, SLEEVE: TYPE: JOURNAL; INSIDE DIAMETER: 250 MM; OUTSIDE DIAMETER: 325 MM; MATERIAL: WHITE METAL; SUPPL P/N: BS2613-1970	50748	30
7	BEARING, SLEEVE: INSIDE DIAMETER: 250 MM; MATERIAL: WHITE METAL; REFERENCE NO: DO 5032; FOR USE ON ELECTRIC PUMP MOTOR; NDE/DE;	251385	30
8	BEARING, SLEEVE: TYPE: EFP MOTOR; INSIDE DIAMETER: 250 MM; OUTSIDE DIAMETER: 428.84 MM; LENGTH: 205 MM; MATERIAL: GR 420/12; MAN	565476	30
9	BEARING, SLEEVE: TYPE: EXTERNAL OIL FEED SLIDE; INSIDE DIAMETER: 250 MM; OUTSIDE DIAMETER: 380 MM; LENGTH: 200 MM; MATERIAL: WHITE METAL; SPECIFICATION: ISO11687-3 DIN31694; SIZE: 22-250 MM; OEM P/N: EMZLB 22-250; CAT NO: RH- 1046;	0714646	30
10	BEARING, SLEEVE: TYPE: EXTERNAL OIL FEED SLIDE NON-LOCATING; INSIDE DIAMETER: 250 MM; OUTSIDE DIAMETER: 380 MM; LENGTH: 200 MM; MATERIAL: WHITE METAL; SPECIFICATION: ISO11687-3 DIN31694; SIZE: 22-250 MM; OEM P/N: EMZLQ 22-250; CAT NO: RH-1046;	0714637	30
11	BEARING, SLEEVE: TYPE: FD FAN MOTOR; INSIDE DIAMETER: 225 MM; OUTSIDE DIAMETER: 350 MM; LENGTH: 200 MM; MATERIAL: WHITE METAL; DRAWING NO: HSR22/EARP225/SS250.SB250/I REV 0; FOR USE ON 3050 KW MOTOR (SERIAL NO:DO 5027/01), NDE/DE; SIZE: 22 MM;	251383	15
12	BEARING, SLEEVE: TYPE: JOURNAL; INSIDE DIAMETER: 200 MM; OUTSIDE DIAMETER: 350 MM; LENGTH: 200 MM; MATERIAL: STL WHITE METAL LINED	694224	15
13	BEARING, SLEEVE: TYPE: JOURNAL; INSIDE DIAMETER: 200 MM; OUTSIDE DIAMETER: 408 MM; LENGTH: 210 MM; MATERIAL: STL WHITE METAL LINED;	34056	15

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