

 Eskom	Scope of work	Matimba Power Station
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Title: **Refurbishment of MV Induction motors for Matimba Power Station**

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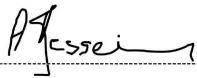
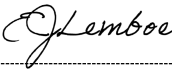
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1. Introduction

1.1 Matimba Power Station.

Matimba Power Station is in Lephalale, in South Africa's Limpopo Province. Designed to generate 4000 MW, Matimba - the Tsonga word for "Power" – was once the largest direct dry-cooled Power Station in the world, with six 665MW turbo-generator units. Coal reserved guarantees Matimba a minimum lifespan of 35 years, extending to a possible 50 years at 2100 - 2130 tons of coal per hour. The annual send-out power from Matimba amounts to approximately 24,000GWh. Matimba is the holder of the world record of 80 days for six units on load.

Technical details:

- Six 665 MW units
- Installed capacity: 3 990MW
- 2001 capacity: 3 690 MW
- Design efficiency at rated turbine MCR (%): 35.60%
- Ramp rate: 28.57% per hour
- Average availability over last 3 years: 93.67%
- Average production over last 3 years: 23 789GWh

2. Supporting clauses

2.1 Scope

2.1.1 Purpose

The purpose of this scope is to define Refurbishment and repairs of MV Induction motors requirements for Matimba Power Station. It is imperative that each supplier aligns their organisation fully to the systems and requirements laid down in this document.

2.1.2 Applicability

This scope is applicable to MV induction motors associated with Matimba Power Station.

Normative/Informative References

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

2.1.3 Normative

- Occupational Health and Safety Act, 85 of 1993.
- ISO 9001:2008: Quality management systems.
- SANS IEC 60034-1 to 30: Rotating electrical machines.
- SANS IEC 60085: Electrical insulation- Thermal classification.
- ISO 10816: Vibration severity standard.
- Eskom 240-89217674: Refurbishment and repair of power station electrical motors Work instruction.
- Eskom 240-56361435: Transport of Power Station Electric Motors Standard.
- Eskom 240-56360387: Storage of Power Station Electric Motors Standard.
- Eskom 240-50237155: New MV Motors Procurement Specification.
- Eskom 240-95138097: Standard Electric Motor Test Certificate.

2.1.4 Informative

ISO 1940-1:2003: Mechanical vibration- Balance quality requirements for rotors in a constant (rigid) state- part 1: Specification and verification of balance tolerance.

2.2 Definitions

Definitions	Explanations
Medium Voltage	Any AC voltage exceeding a 1000V
Outage	A planned or unplanned shutdown project related to one or more of the <i>Employer's</i> Power Station units
Induction Motor	Electric motor in which the electric current in the rotor needed to produce torque is obtained by electromagnetic induction from the magnetic field of the stator winding
Contractor	Service provider contracted for supply specific service to Eskom Matimba power station.
Employer	Eskom or Eskom Matimba power station representative appointed in writing.

2.3 Abbreviations

Abbreviations	Explanation
AC	Alternating Current
KPA	Key performance area
KPI	Key performance indicators

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DC	Direct Current
DE	Drive End
IBI	Integrated Business Improvement Model
MV	Medium Voltage
MM	Material Management
NDE	Non- drive end
SOS/SOW	Scope of service/ Scope of work
OEM	Original Equipment Manufacture
PPE	Personal protective equipment
QC	Quality control

2.4 Roles and Responsibilities

- N/A

2.5 Process for Monitoring

2.5.1 Technical KPIs

Item	KPI	Targets
1	Breakdown or emergency reaction time	Within 12 hours
3	Delivery on emergency work (Overhaul)	3 weeks
5	Delivery on emergency work (Rewind)	6 weeks
7	Onsite fault finding call out	Within 8 hours

2.5.2 SHEQ KPIs

Item	KPI	Targets
1	SHEQ Performance Report	>95%

3. Site Visit

1. Clarification meeting and site visit is compulsory for all contractors.
2. Procurement officer to form part of the site visit team.
3. Invited contractors to bring own PPE during site visits.
4. All official communication will be in the form of writing.

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5. A register will be signed by all in attendance and kept as record.
6. Contractor who do not attend and goes to site visit won't be considered.
7. List the contact information of the end users.

4. Document Content

4.1.1 Scope of Work

1. ID FAN MOTOR 3270kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the heat exchanger / radiator
4	Replace broken cooler tubes/radiator
5	Pressure test the coolers tubes/radiator
6	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Replace heaters
3	Overhaul heaters (Replace wiring)
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator

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Item No	Description
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and bottom of winding per phase)
	DE SHIELD/NDE SHIELD
1	Replace fixing bolts
	WHITE METAL BEARINGS
1	Re-metal white metal DE bearing
2	Re-metal white metal NDE bearing
3	Refurbish DE bearing housing to fit standard bearing refurbishment specifications
4	Refurbish NDE bearing housing to fit standard bearing refurbishment specifications

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Item No	Description
5	Overhaul DE seal
6	Overhaul NDE seal
7	Replace site glass and clean ports
8	Replace seals
9	Bearing insulation test point inspect and repair (Inspect specifically for test point housing insulation damage)
10	Replace bearing (see nameplate data supplied on SOW for this motor)
11	Inspect bearing housing (Assess the bearing housing, bearing seating surfaces for wear/damage)
ACCESSORIES	
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Skim Stator Feet
17	Re-tap Mounting Holes
18	Re-tap Holes & Fit New Jacking Bolts
19	Micro-weld & machine NDE/DE outer seal landing 270 X 90 / 340 X 135
20	Micro-weld & machine NDE/DE inner seal landing 270 X 70 / 340 X 123
21	Micro-weld & machine NDE/DE inner seal landing 270 X 50 / 340 X 123
22	Fit new earth lugs
23	Clean & polish spigots

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Item No	Description
24	Fit new earth brush & holder
25	Fit new Zorc
26	Manufacture new rotor core
27	Remove old rotor core & fit new
28	Machine off rotor end rings & remove rotor bars
29	Manufacture new rotor end rings & bars
30	Re-bar rotor complete
31	Fit new bearing probes DE & NDE
32	Repair oil rings & fit new screws
33	Repair bearing housing nips
34	Re-sleeve vacuum seals
35	Light line bore stator core
36	Skim rotor core
37	Supply & fit new earth brush & holder 2 off
38	Supply & fit new insulated rings
39	Repair bearing housing nips
40	Replace missing wedges & epoxy
41	Machine DE bearing journal radius
42	Light machine DE outer seal landing
43	Overhaul desicator
44	Fit new insulated rings & final machine OD
45	Chemical clean 2 off cooler bundles
46	Supply stainless steel bolts
47	Pressure test after repair
48	Replace 2 off missing stator wedges & epoxy
49	Re-tap all mounting holes
50	Manufacture new interlock dust seal carrier
51	Re-insulated bearing OD & final machine
52	Manufacture new DE outer seal sleeve
53	Supply & fit new earth brush & holder
54	Replace stator jacking bolts
55	Supply new vibration blocks

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Item No	Description
56	Supply & fit new bearing temperature
57	Repair bearing nips
58	Fit new pipe work & ball valves
59	Rewind stator complete fit new magnetic wedges & blocks
	ROUTINE TESTS AND TEST AS AND WHEN REQUIRED
1	Measure and record winding resistance test
2	Perform and record insulation resistance test
3	Perform and record polarization test
4	Perform and record Tan Delta test
5	Perform and record off-line partial discharge test
6	Perform wedge tightness test on stator
7	Perform induction test
8	Perform stator ELCID test on rotor
9	Perform rotor core ELCID test
10	NDT on the rotor shaft
11	NDT on fan impellers or runners (Whole impeller)
12	Perform rotor bar to bar test (consider the number of bars per rotor)
13	Ultrasonic testing on white metal bearing surface
14	High voltage AC test
15	Balancing test
16	Copper material analysis test /check
17	Bearing insulation test
18	Bearing heat run test and check the bearing temperatures and vibration
19	Stator winding temperature measurements
20	Load test the motor and check efficiency

2. FD FAN MOTOR 2310kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station

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Item No	Description
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the heat exchanger / radiator
4	Replace broken cooler tubes
5	Pressure test the coolers tubes / radiator
6	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters (replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)

Item No	Description
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Supply new earth brushes
15	Fit new mag centre indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and bottom of winding per phase) each
	DE SHIELD/ NDE SHIELD
1	Replace fixing bolts
	WHITE METAL BEARINGS
1	Re-metal white DE metal bearing
2	Re-metal white NDE metal bearing
3	Refurbishment DE bearing housing to fit standard bearing refurbishment specifications
4	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
5	Overhaul DE seal
6	Overhaul NDE seal
7	Replace site glass and clean ports
8	Replace seals
9	Bearing insulation test point inspect and repair (Inspect specifically for test point housing insulation damage)
10	Replace bearing (see nameplate data supplied on SOW for this motor)
11	Inspect bearing housing

Item No	Description
	ACCESSORIES
1	Replace stator jacking bolts
2	Supply and fit new DE bearing
3	Conduct stator core flux and watts loss test
4	Rewind stator complete fit new magnetic wedges and blocks
5	VPI stator, cure, fit new stator leads and PT100's
6	Open keyway, check run out, pre-machine coupling journal
7	Pre-machine DE and NDE outer and inner seal landings and bearing journals
8	Re-cut keyway, final grind journals
9	Supply new external fan
10	Skim stator feet
11	Supply new desiccators
12	Re-insulate bearing OD
13	Repair bearing nips
14	Repair stator core (vibrate stator core to remove hot spots)
15	New internal fans
16	Inspect shock absorber rubbers (replace if damaged)
17	Supply new earth brushes
18	Supply new vibration blocks
19	Fit new floating lab seals
20	Supply new sight glasses
21	Supply new breathers
22	Fit new pipe work and ball valves
23	Fit new set of O-rings
24	Shotblast, clean and paints the housings
25	Repair journals and landings
26	Burn out stator, remove coils and prepare core for rewind
27	Manufacture new stator coil and insulation rewind kit
28	Overhaul boxes and re-bed brushes
29	Overhaul air to air canopy
30	Replace connector blocks
31	Supply and fit new insulators-triangular type

Item No	Description
32	Test stator, QC and paint
33	Modify terminal boxes on request
34	Extend supply leads on request
35	Fit new gaskets bolts
36	Touch up paint work and routine test
37	Supply & fit new bearing probes DE & NDE
38	Fit new earth lugs
39	Replace missing stator wedges & epoxy
40	Panel beat radiator cover
41	Manufacture new DE/NDE inner/outer seal sleeve in different sizes
42	Microweld & machine DE/NDE coupling landing in different sizes
43	Microweld & machine DE/NDE inner seal landing in different sizes
44	Fit new high jacking pies & inlet pipes
45	Machine housings for oil jacking pipes
46	Remove terminal boxes, main & star
47	Supply & fit new main & star side leads & re-solder lugs
48	Re-fit terminal boxes, main & star
49	Re-tap all mounting holes
50	Replace missing wedges & epoxy
51	Clean & polish stator spigots
52	Fit new bearing insulated rings
53	Chemical clean 2 off cooler/tube bundles
54	Supply stainless steel bolts
55	Pressure test after repair
56	Supply and fit new desicator (1or2 off)

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Item No	Description
57	Remove inner and outer seal landing sleeves and manufacture new, refit to shaft
58	Supply and fit new DE & NDE bearing probes on site (2 off)
59	Replace missing wedges & epoxy
60	Machine bearing housing for oil jacking
61	Fit new stain steel fasteners
62	Supply and fit new insulated rings 2 off
63	Fit missing stator wedges
64	Fit new bearing probes
65	Fit new canopy mounting rubbers
66	Fit new PT connector
67	Overhaul mono-blocks
68	New high jacking pipes and inner pipes
69	Clean cooling tube bundle A
70	Clean cooling tube bundle B
	ROUTINE TESTS AND TEST AS AND WHEN REQUIRED
1	Measure and record winding Resistance test
2	Perform and record Insulation resistance test
3	Perform and record Polarization test
4	Perform and record Tan Delta test
5	Perform and record off-line partial discharge test
6	Perform wedge tightness test on stator
7	Perform induction test
8	Preform stator ELCID test on the stator
9	Perform rotor core ELCID test

Item No	Description
10	NDT on the rotor shaft
11	NDT on fan impellers or runners (Whole impeller)
12	Perform rotor bar to bar test (consider the number of bars per rotor)
13	Ultrasonic testing on white metal bearing surface
14	High voltage AC test
15	Balancing test
16	Copper material analysis test /check
17	Bearing insulation test
18	Bearing heat run test and check the bearing temperatures and vibration
19	Stator winding temperature measurements
20	Load test the motor and check efficiency

3. PA FAN MOTOR 2350kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers

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Item No	Description
3	Overhaul the heat exchanger / radiator
4	Replace broken cooler tubes
5	Pressure test the coolers tubes / radiator
6	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters (Replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including Terminal box and leads-point1)
7	Re-insulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR

Item No	Description
1	PT100 resistance test/measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and bottom of winding per phase) each
DE SHIELD/ NDE SHIELD	
1	Replace fixing bolts
WHITE METAL BEARINGS	
1	Re-metal white metal DE bearing (see nameplate data supplied on SOW for this motor)
2	Re-metal white metal NDE bearing (see nameplate data supplied on SOW for this motor)
3	Refurbishment DE bearing housing to fit standard bearing refurbishment specifications
4	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
5	Overhaul DE seal
6	Overhaul NDE seal
7	Replace site glass and clean ports
8	Replace seals
9	Bearing insulation test point inspect and repair (Inspect specifically for test point housing insulation damage)
10	Replace bearing (see nameplate data supplied on SOW for this motor)
11	Inspect bearing housing
ACCESSORIES	
1	Replace stator jacking bolts
2	Supply and fit new DE bearing
3	Conduct stator core flux and watts loss test
4	Rewind stator complete fit new magnetic wedges and blocks
5	VPI stator, cure, fit new stator leads and PT100's
6	Open keyway, check run out, pre-machine coupling journal
7	Pre-machine DE and NDE outer and inner seal landings and bearing journals
8	Re-cut keyway, final grind journals
9	Supply new external fan
10	Skim stator feet

Item No	Description
11	Supply new desiccators
12	Re-insulate bearing OD
13	Repair bearing nips
14	Repair stator core (vibrate stator core to remove hot spots)
15	New internal fans
16	Inspect shock absorber rubbers (replace if damaged)
17	Supply new earth brushes
18	Supply new vibration blocks
19	Supply new breathers
20	Fit new pipe work and ball valves
21	Fit new set of O-rings
22	Shotblast, clean and paints the housings
23	Repair journals and landings
24	Burn out stator, remove coils and prepare core for rewind
25	Manufacture new stator coil and insulation rewind kit
26	Overhaul boxes and re-bed brushes
27	Overhaul air to air canopy
28	Replace connector blocks
29	Supply and fit new insulators-triangular type
30	Test stator, QC and paint
21	Skim Stator Feet
22	Re-tap Mounting Holes
23	Re-tap Holes & Fit New Jacking Bolts
24	Micro-weld & machine NDE/DE outer seal landing
25	Micro-weld & machine NDE/DE inner seal landing
27	Fit new earth lugs
28	Clean & polish spigots
29	Fit new earth brush & holder
30	Fit new Zorc
31	Manufacture new rotor core
32	Remove old rotor core & fit new
33	Machine off rotor end rings & remove rotor bars

Item No	Description
34	Manufacture new rotor end rings & bars
35	Re-bar rotor complete
36	Fit new bearing probes DE & NDE
37	Repair oil rings & fit new screws
38	Repair bearing housing nips
39	Re-sleeve vacuum seals
40	Light line bore stator core
41	Skim rotor core
42	Supply & fit new earth brush & holder 2 off
43	Supply & fit new insulated rings
44	Repair bearing housing nips
45	Replace missing wedges & epoxy
46	Machine DE bearing journal radius
47	Light machine DE/NDE outer seal landing
48	Overhaul desicator
49	Fit new insulated rings & final machine OD
50	Chemical clean 2 off cooler bundles
51	Supply stainless steel bolts & assemble
52	Pressure test after repair
53	Replace 2 off missing stator wedges & epoxy
54	Re-tap all mounting holes
55	Manufacture new interlock dust seal carrier
56	Re-insulated bearing OD & final machine
57	Manufacture new DE outer seal sleeve
58	Supply & fit new earth brush & holder
60	Fit new DE/NDE circlips 2 off 170mm
61	Supply & fit new DE/NDE bearing probes
62	Replace 3 off heat exchanger damping rubbers
63	Grit blast & paint heat exchanger casing
64	Supply & fit new DE/NDE bearing (6034 C3)
65	Repair bearing housings OD'S & machine back to standard
	ROUTINE TESTS AND TEST AS WHEN REQUIRED

Item No	Description
1	Measure and record winding resistance test
2	Perform and record insulation resistance test
3	Perform and record polarization test
4	Tan Delta test
5	Partial Discharge test
6	Slot wedging test on stator
7	ELCID test on stator
8	ELCID test on rotor
9	NDT on the rotor shaft
10	NDT on fan impellers or runners (Whole impeller)
11	Rotor bar to bar test (consider the number of bars per rotor)
12	Ultrasonic testing on white metal bearing surface
13	High voltage test
14	Balancing test
15	Copper material analysis test /check
16	Bearing insulation test
17	Bearing heat run test and check the bearing temperatures and vibration
18	Perform induction test
19	Stator winding temperature measurements
20	Load test the motor and check efficiency

4. Mill Motor 2150kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads

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Item No	Description
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers (each)
3	Overhaul the cooler
4	Pressure test the coolers tubes / radiator
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters (replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including in terminal box and leads)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity

Item No	Description
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Inspect coupling keyway on shaft for damage and coupling bore (Repair with micro weld if needed)
14	Brazing of rotor end laminations
15	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and bottom of winding per phase) each
	DE SHIELD AND NDE SHIELD
1	Replace fixing bolts
	WHITE METAL BEARING
1	Re-metal white metal DE bearing (see nameplate data supplied on SOW for this motor)
2	Re-metal white metal NDE bearing (see nameplate data supplied on SOW for this motor)
3	Refurbishment DE bearing housing to fit standard bearing refurbishment specifications
4	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
5	Overhaul DE seal
6	Overhaul NDE seal
7	Replace site glass and clean ports
8	Replace seals
9	Bearing insulation test point inspect and repair (Inspect specifically for test point housing insulation damage)
10	Replace bearing (see nameplate data supplied on SOW for this motor)
11	Inspect bearing housing (assess the bearing housing, bearing seating surfaces for wear/damage)
	ACCESSORIES
1	Replace stator jacking bolts
2	Supply and fit new DE bearing
3	Conduct stator core flux and watts loss test

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Item No	Description
4	Rewind stator complete fit new magnetic wedges and blocks
5	VPI stator, cure, fit new stator leads and PT100's
6	Open keyway, check run out, pre-machine coupling journal
7	Pre-machine DE and NDE outer and inner seal landings and bearing journals
8	Re-cut keyway, final grind journals
9	Supply new external fan
10	Skim stator feet
11	Supply new desiccators
12	Re-insulate bearing OD
13	Repair bearing nips
14	Repair stator core (vibrate stator core to remove hot spots)
15	New internal fans
16	Inspect shock absorber rubbers (replace if damaged)
17	Supply new earth brushes
18	Supply new vibration blocks
19	Supply new breathers
20	Fit new pipe work and ball valves
21	Fit new set of O-rings
22	Shotblast, clean and paints the housings
23	Repair journals and landings
24	Burn out stator, remove coils and prepare core for rewind
25	Manufacture new stator coil and insulation rewind kit
26	Overhaul boxes and re-bed brushes
27	Overhaul air to air canopy
28	Replace connector blocks
29	Supply and fit new insulators-triangular type
30	Test stator, QC and paint
31	Re-tap all mounting holes
32	Clean & polish spigots
33	Manufacture new fan cowl screen
34	Microweld & machine NDE outer seal landing in different sizes
35	Manufacture new insulated rings 2 off

Item No	Description
36	Manufacture new stator core – stacked, welded & machines
37	Skim rotor core
38	Overhaul fan cowl & external
39	Microweld & machine DE/NDE coupling landing in different sizes & cut keyway
40	Microweld & machine DE/NDE inner/outer seal landing in different sizes
41	Fit new insulated rings
42	Fit new high jacking pipes & inlet pipes and machine housing
43	Machine bearing housing for oil jacking pipes
44	Re-insulate bearing OD
45	Re-insulate bearing nips
46	Fit new high jacking pipes & inlet pipes
47	Re-sleeve vacuum seals
48	Overhaul earth brush & holder
50	Overhaul desicator 1 or 2 off
51	Replace dumping rubber 3 off
52	Fit new bearing probes wire DE/NDE
53	Supply new earth brushes & holder
54	Repair mounting holes on star point terminal box mounting to stator & re-fit
55	Supply & fit new star point connector
56	Replace current Electric CT's 2 off
57	Manufacture new DE/NDE outer seal sleeve landing in different sizes
58	Manufacture new DE/NDE inner seal sleeve landing in different sizes
59	Fit new bolts and washers on bearing housings DE/NDE
60	Line bore stator core to remove hotspots
61	Repair damaged wedges on stator
62	Light skim rotor core surface
63	Manufacture new brass oil pick up ring
64	New drain plugs
65	Manufacture new DE/NDE seal plate (earth brush holder cover plate)
66	Remove old stator core
67	Weld and machine casing bore to suit new core, fit new core and secure
68	Re-tap all jacking bolt holes

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Item No	Description
69	Manufacture new rotor core complete
70	Rebar new rotor core with new bars and end-rings double cage rotor
71	Remove old rotor core and fit new to shaft
72	Machine rotor core to suit air gap
73	Repair broken seal carrier housing
74	Manufacture new brass oil pickup ring
75	Manufacture new inner/outer vacuum seal and insert
76	Manufacture new seal carrier
77	Manufacture new seal carrier insert
78	Supply new bearing housing earthing straps
79	Repair fibre glass baffle plate
80	Light machine rotor core surface
81	Manufacture new NDE/DE white bearing
82	Overhaul external fan & cowl
83	New insulation rings
84	Re-NDT rotor shaft after micro welding
85	Supply and fit new earth straps
86	Supply fit new cowl mounting rubbers
87	Fit new PT connectors
88	Fit new diots
89	Fit new sleeving for bearing probes
90	Fit new bolt, washers and springs
91	Repair terminal box to suit casing
92	Repair screen
93	Repair cowl baffles
94	Sand blast all loose components
95	Overhaul external and internal fan
96	Fit new wedges
97	Repair internal baffles
98	Overhaul stator and spray with insulation varnish
99	Manufacture new DE & NDE inner and outer sleeves
100	Manufacture new floating LAB seals 2 off

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Item No	Description
101	Fit new earth lugs
102	Overhaul coupling and re-fit
103	Overhaul fiberglass inserts
104	Plug stator holes
105	Panel beat casing
106	Sandblast all loose components
107	Fit canopy mounting rubbers
108	Supply and fit new stainless-steel fasteners and pressure test tube bundle
109	Supply silicon gaskets
110	Fit new insulator for connection side
111	Overhaul rotor and spray with insulation varnish
112	Manufacture new terminal box bottom cover
113	Supply & fit 4 off new heater terminal blocks
114	Repair epoxy baffles
	ROUTINE TESTS AND TEST AS WHEN REQUIRED
1	Measure and record winding resistance test
2	Perform and record insulation resistance test
3	Perform and record Tan Delta test
4	Perform and record polarization test
5	Perform and record off-line partial discharge test
6	Perform wedge tightness test on stator
7	Perform induction test
8	Perform stator ELCID test on stator
9	Perform rotor core ELCID test
10	NDT on the rotor shaft
11	NDT on fan impellers or runners (Whole impeller)
12	Perform rotor bar to bar test (consider the number of bars per rotor)
13	Ultrasonic testing on white metal bearing surface
14	High voltage AC test
15	Balancing test
16	Copper material analysis test /check
17	Bearing insulation test

Item No	Description
18	Bearing heat run test and check the bearing temperatures and vibration
19	Stator winding temperature measurements
20	Load test the motor and check efficiency

5. T1 Conveyor Drive Motor 820kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the cooler
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters (replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint

Item No	Description
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (incl terminal box and leads-point1)
7	Reinsulate tail leads
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/measure RTD
2	Install PT100 on the overhang winding (DE and NDE) each
3	Install PT100 on the overhang winding (Top and bottom of winding per phase) each
	ROTOR
1	Treat and paint stator with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	DE SHIELD/ NDE SHIELD
1	Replace fixing bolts
	WHITE METAL BEARING
1	Re-metal white metal DE bearing (see nameplate data supplied on SOW for this motor)
2	Re-metal white metal NDE bearing (see nameplate data supplied on SOW for this motor)
3	Refurbishment DE bearing housing to fit standard bearing refurbishment specifications

Item No	Description
4	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
5	Overhaul DE seal
6	Overhaul NDE seal
7	Replace site glass and clean ports
8	Replace seals
9	Bearing insulation test point inspect and repair (Inspect specifically for test point housing insulation damage)
10	Replace bearing (see nameplate data supplied on SOW for this motor)
11	Inspect bearing housing
	ACCESSORIES
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
14	Supply and fit new insulators-triangle type
15	High voltage AC test
16	Balancing test
17	Copper material analysis test /check
18	Bearing insulation test
19	Bearing heat run test and check the bearing temperatures and vibration
20	Stator winding temperature measurements
21	Load test the motor and check efficiency

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Item No	Description
22	Cut keyway
23	NDT after micro welding
24	Replace stripped, missing bolts and plugs
25	Supply and fit 2 off new desicator
26	Fit new earth lugs
27	Sandblast all loose components
28	Fit new nuts on terminal box threads
29	Remove old and fit new feet (4 off)
30	Skim stator feet
31	Re-tap all mounting holes
32	Polish spigots
33	Overhaul screens and fans
34	Re-insulate bearing housings
35	Fit new earth brush and holder complete
36	Re-sleeve vacuum seal
37	Manufacture new IP55 seals
38	Manufacture new oil rings
39	Re-insulate vacuum seal (2 off)
40	Supply and fit bearing probes (3 off)
41	Fit new probes 200mm (2 off)
42	Fit new desicator (2 off)
43	Fit new temperature gauge
44	Remove clean and refit coupling
45	Re-tap all mounting holes
46	Fit missing bolts, flats, and springs
47	Overhaul screen and external fan
48	Microweld and machine coupling landing
49	Microweld and machine NDE outer seal landing
50	Re-insulate bearing housing
51	Fit new earth brush and holder complete
52	Manufacture new rotor core
53	Machine off rotor short circuiting rings & remove rotor bars

Item No	Description
54	Manufacture new rotor bars & short-circuiting rings
55	Re-bar rotor complete

6. S1 Conveyor Motor 700kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes and clean with solvent
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters (Replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity

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Item No	Description
6	Replace tail leads (including Terminal box and leads- point1)
7	Re-insulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
	DE SHIELD / NDE SHIELD
1	Replace fixing bolts
	BEARINGS
1	Refurbishment DE bearing housing to fit standard bearing refurbishment specifications.
2	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications.
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Replace seals
5	Inspect bearing housing
	ACCESSORIES
1	Fit new internal fans as and when required

Item No	Description
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Balancing test
17	Copper material analysis test/ check
18	Bearing insulation test
19	Bearing heat run test and check the bearing temperatures and vibration
20	Stator winding temperature measurements
21	Load test the motor and check efficiency
22	NDT rotor shaft
23	Manufacture new rotor core
3	Remove old rotor core and fit new
4	Machine off rotor short circuiting rings & remove rotor bars
5	Manufacture new rotor bars & short-circuiting rings
7	Re-bar rotor complete
8	Re-insulate DE & NDE bearing housings
9	Fit earth lugs
10	Fit new grease pipes & fittings
11	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
12	Manufacture new NDE/DE flinger
13	Re-tap all mounting holes

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Item No	Description
14	Polish spigots
15	Remove, clean & Re-fit coupling
16	Re-insulate NDE/DE bearing housings
17	Fit new lock washers 110mm
18	Fit new earth brush & holder
19	Repair baffles
20	Overhaul coupling & re-fit
21	Overhaul external fan
22	Skim stator feet
23	Supply & fit new auxiliary terminal box for heaters
24	Light machine flingers & cut new threads
25	Repair rotor shaft threads
26	Manufacture new stator core – stacked & welded
27	Line bore stator core for air gap
28	Machine off rotor end rings & remove rotor bars
29	Manufacture new rotor end rings & rotor bars
30	Microweld & machine NDE/DE inner seal landing in different sizes
31	Microweld & machine NDE/DE outer seal landing in different sizes
32	Microweld & machine NDE/DE external fan landing in different sizes
33	Weld & machine NDE/DE bearing cap
34	Re-tap holes & fit new jacking bolts
35	Supply & fit new jacking bolts
36	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
37	Replace bearing probes
38	Fit new grease pipes & fittings
39	Overhaul fan cowl

7. S2 Conveyor Motor 200kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station

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Item No	Description
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes with solvent
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters (replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (Including Terminal box and leads-point1)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)

Item No	Description
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
RESISTANCE TEMPERATURE DETECTOR	
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang windings (DE and NDE)
3	Install PT100 on the overhang windings (Top and bottom of winding per phase)
DE SHIELD/NDE SHIELD	
1	Replace fixing bolts
BEARINGS	
1	Refurbishment DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Inspect bearing housing
5	Replace seals
ACCESSORIES	
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers(replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings

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Item No	Description
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Balancing test
17	Copper material analysis test/check
18	Bearing insulation test
19	Stator winding temperature measurements
20	Bearing heat run test and check the bearing temperatures and vibration
21	Load test the motor and check efficiency
22	NDT rotor shaft
23	Manufacture new rotor core
24	Remove old rotor core and fit new
25	Machine off rotor short circuiting rings & remove rotor bars
26	Manufacture new rotor bars & short-circuiting rings
27	Re-bar rotor complete
28	Re-insulate DE & NDE bearing housings
29	Fit earth lugs
30	Fit new grease pipes & fittings
31	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
32	Manufacture new NDE/DE flinger
33	Re-tap all mounting holes
34	Polish spigots
35	Remove, clean & Re-fit coupling
36	Re-insulate NDE/DE bearing housings
37	Fit new lock washers 110mm
38	Fit new earth brush & holder
39	Repair baffles
40	Overhaul coupling & re-fit
41	Overhaul external fan

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Item No	Description
42	Skim stator feet
43	Supply & fit new auxiliary terminal box for heaters
44	Light machine flingers & cut new threads
45	Repair rotor shaft threads
46	Manufacture new stator core – stacked & welded
47	Line bore stator core for air gap
48	Machine off rotor end rings & remove rotor bars
49	Manufacture new rotor end rings & rotor bars
40	Microweld & machine NDE/DE inner seal landing in different sizes
41	Microweld & machine NDE/DE outer seal landing in different sizes
42	Microweld & machine NDE/DE external fan landing in different sizes
43	Weld & machine NDE/DE bearing cap
44	Re-tap holes & fit new jacking bolts
45	Supply & fit new jacking bolts
46	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
47	Replace bearing probes
48	Fit new grease pipes & fittings
49	Overhaul fan cowl

8. S3 Conveyor Motor 275kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals

Item No	Description
4	Replace current Electric CT
HEAT EXCHANGER	
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals
SPACE HEATERS	
1	Test heaters
2	Overhaul heaters (Replace wiring)
3	Replace heaters
STATOR HOUSING	
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including in terminal box & leads- point1)
7	Reinsulate tail leads
ROTOR	
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)

Item No	Description
13	Replace fixing bolts
14	Brazing of rotor and laminations
15	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ measure RTD
2	Install PT100 on the overhang windings (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of the winding per phase)
	DE SHIELD/ NDE SHIELD
1	Replace fixing bolts
	BEARINGS
1	Refurbish DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbish NDE bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Replace seals
5	Inspect bearing housing
	ACCESSORIES
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers(replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks

Item No	Description
15	Supply and fit new insulators-triangle type
16	Bearing insulation test
17	Bearing heat run test and check the bearing temperatures and vibration
18	Stator winding temperature measurements
19	Load test the motor and check efficiency
20	NDT rotor shaft
21	Manufacture new rotor core
22	Remove old rotor core and fit new
23	Machine off rotor short circuiting rings & remove rotor bars
24	Manufacture new rotor bars & short-circuiting rings
25	Re-bar rotor complete
26	Re-insulate DE & NDE bearing housings
27	Fit earth lugs
28	Fit new grease pipes & fittings
29	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
30	Manufacture new NDE/DE flinger
31	Re-tap all mounting holes
32	Polish spigots
33	Remove, clean & Re-fit coupling
34	Re-insulate NDE/DE bearing housings
35	Fit new lock washers 110mm
36	Fit new earth brush & holder
37	Repair baffles
38	Overhaul coupling & re-fit
39	Overhaul external fan
40	Skim stator feet
41	Supply & fit new auxiliary terminal box for heaters
42	Light machine flingers & cut new threads
43	Repair rotor shaft threads
44	Manufacture new stator core – stacked & welded
45	Line bore stator core for air gap
46	Machine off rotor end rings & remove rotor bars

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Item No	Description
47	Manufacture new rotor end rings & rotor bars
48	Microweld & machine NDE/DE inner seal landing in different sizes
49	Microweld & machine NDE/DE outer seal landing in different sizes
50	Microweld & machine NDE/DE external fan landing in different sizes
51	Weld & machine NDE/DE bearing cap
52	Re-tap holes & fit new jacking bolts
53	Supply & fit new jacking bolts
54	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
55	Replace bearing probes
56	Fit new grease pipes & fittings
57	Overhaul fan cowl

9. S4 Conveyor Motor 320kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals

Item No	Description
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters(replace wiring)
3	Replace heaters
	STATOR WINDING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads-point1)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and bottom of winding per phase)
	DE SHIELD/NDE SHIELD

Item No	Description
1	Replace fixing bolts
	BEARINGS
1	Refurbishment DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbish NDE bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Inspect bearing housing
5	Replace seals
	ACCESSORIES
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Balancing test
17	Copper material analysis test/check
18	Bearing insulation test
19	Bearing heat run test and check the bearing temperatures and vibration
20	Stator winding temperature measurements
21	Load test the motor and check efficiency
22	NDT rotor shaft
23	Manufacture new rotor core

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Item No	Description
24	Remove old rotor core and fit new
25	Machine off rotor short circuiting rings & remove rotor bars
26	Manufacture new rotor bars & short-circuiting rings
27	Re-bar rotor complete
28	Re-insulate DE & NDE bearing housings
29	Fit earth lugs
30	Fit new grease pipes & fittings
31	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
32	Manufacture new NDE/DE flinger
33	Re-tap all mounting holes
34	Polish spigots
35	Remove, clean & Re-fit coupling
36	Re-insulate NDE/DE bearing housings
37	Fit new lock washers 110mm
38	Fit new earth brush & holder
39	Repair baffles
40	Overhaul coupling & re-fit
41	Overhaul external fan
42	Skim stator feet
43	Supply & fit new auxiliary terminal box for heaters
44	Light machine flingers & cut new threads
45	Repair rotor shaft threads
45	Manufacture new stator core – stacked & welded
46	Line bore stator core for air gap
47	Machine off rotor end rings & remove rotor bars
48	Manufacture new rotor end rings & rotor bars
49	Microweld & machine NDE/DE inner seal landing in different sizes
50	Microweld & machine NDE/DE outer seal landing in different sizes
51	Microweld & machine NDE/DE external fan landing in different sizes
52	Weld & machine NDE/DE bearing cap
53	Re-tap holes & fit new jacking bolts
54	Supply & fit new jacking bolts

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Item No	Description
55	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
56	Replace bearing probes
57	Fit new grease pipes & fittings
58	Overhaul fan cowl

10. S5 Conveyor Motor 250kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (Clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Replace heaters
3	Overhaul heaters (replace wiring)
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator

Item No	Description
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads-point 1)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
	DE SHIELD/NDE SHIELD
1	Replace fixing bolts
	BEARINGS
1	Refurbish DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Replace seals
5	Inspect bearing housing

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Item No	Description
	ACCESSORIES
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	High voltage test
17	Copper material analysis test/check
18	Bearing insulation test
19	Bearing heat run test and check the bearing temperatures and vibration
20	Stator winding temperature measurements
21	Load test the motor and check efficiency
1	NDT rotor shaft
2	Manufacture new rotor core
3	Remove old rotor core and fit new
4	Machine off rotor short circuiting rings & remove rotor bars
5	Manufacture new rotor bars & short-circuiting rings
7	Re-bar rotor complete
8	Re-insulate DE & NDE bearing housings
9	Fit earth lugs
10	Fit new grease pipes & fittings
11	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap

Item No	Description
12	Manufacture new NDE/DE flinger
13	Re-tap all mounting holes
14	Polish spigots
15	Remove, clean & Re-fit coupling
16	Re-insulate NDE/DE bearing housings
17	Fit new lock washers 110mm
18	Fit new earth brush & holder
19	Repair baffles
20	Overhaul coupling & re-fit
21	Overhaul external fan
22	Skim stator feet
23	Supply & fit new auxiliary terminal box for heaters
24	Light machine flingers & cut new threads
25	Repair rotor shaft threads
26	Manufacture new stator core – stacked & welded
27	Line bore stator core for air gap
28	Machine off rotor end rings & remove rotor bars
29	Manufacture new rotor end rings & rotor bars
30	Microweld & machine NDE/DE inner seal landing in different sizes
31	Microweld & machine NDE/DE outer seal landing in different sizes
32	Microweld & machine NDE/DE external fan landing in different sizes
33	Weld & machine NDE/DE bearing cap
34	Re-tap holes & fit new jacking bolts
35	Supply & fit new jacking bolts
36	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
37	Replace bearing probes
38	Fit new grease pipes & fittings
39	Overhaul fan cowl

11. Overland Conveyor Drive Motor 500kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BEX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (Clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul the heaters (replace wiring)
2	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads-point1)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint

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Item No	Description
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
RESISTANCE TEMPERATURE DETECTOR	
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
DE SHIELD AND NDE SHIELD	
1	Replace fixing bolts
ACCESSORIES	
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes

Item No	Description
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Perform stator ELCID test on stator
17	Perform rotor core ELCID test
18	NDT on the rotor shaft
19	NDT on fan impellers or runners (Whole impeller)
20	Perform Rotor bar to bar test (consider the number of bars per motor)
21	High voltage test
22	Balancing test
23	Copper analysis test/check
24	Bearing heat run test and check the bearing temperatures and vibration
25	Stator winding temperature measurements
26	Bearing insulation rest
27	Load test the motor and check efficiency
28	NDT rotor shaft
29	Manufacture new rotor core
30	Remove old rotor core and fit new
31	Machine off rotor short circuiting rings & remove rotor bars
32	Manufacture new rotor bars & short-circuiting rings
33	Re-bar rotor complete
34	Re-insulate DE & NDE bearing housings
35	Fit earth lugs
36	Fit new grease pipes & fittings
37	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
38	Manufacture new NDE/DE flinger
39	Re-tap all mounting holes
40	Polish spigots
41	Remove, clean & Re-fit coupling
42	Re-insulate NDE/DE bearing housings
43	Fit new lock washers 110mm
44	Fit new earth brush & holder

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Item No	Description
45	Repair baffles
46	Overhaul coupling & re-fit
47	Overhaul external fan
48	Skim stator feet
49	Supply & fit new auxiliary terminal box for heaters
50	Light machine flingers & cut new threads
51	Repair rotor shaft threads
52	Manufacture new stator core – stacked & welded
53	Line bore stator core for air gap
54	Machine off rotor end rings & remove rotor bars
55	Manufacture new rotor end rings & rotor bars
56	Microweld & machine NDE/DE inner seal landing in different sizes
57	Microweld & machine NDE/DE outer seal landing in different sizes
58	Microweld & machine NDE/DE external fan landing in different sizes
59	Weld & machine NDE/DE bearing cap
60	Re-tap holes & fit new jacking bolts
61	Supply & fit new jacking bolts
62	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
63	Replace bearing probes
64	Fit new grease pipes & fittings
65	Overhaul fan cowl
66	Polish DE/NDE bearing housings to specification
67	Manufacture new grease slinger NDE/DE
68	Supply & fit new DE/NDE bearings, seals @ circlips (NU 322 C3 & 6322 C3)
69	Microweld & machine DE/NDE coupling landing & cut keyway in different sizes
70	Microweld & machine DE/NDE fan landing & cut keyway in different sizes

12. T8 Conveyor Drive Motor 260kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station

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Item No	Description
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEATING EXCHANGER
1	remove oil from cooler tubes (Clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the cooler
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters(replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads-point1)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)

Item No	Description
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang windings (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
	DE SHIELD/ NDE SHIELD
1	Replace fixing bolts
	BEARINGS
1	Refurbish DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Replace seals
5	Inspect bearing housing
	ACCESSORIES
1	Measure and record Winding Resistance test
2	Perform and Insulation resistance test
3	Perform and record Polarization test
4	Perform and record Tan Delta test
5	Perform and record off-line Partial Discharge test
6	Perform wedge tightness test on stator
7	Perform induction test
8	Perform stator ELCID test on stator

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Item No	Description
9	Perform rotor core ELCID test
10	NDT on the rotor shaft
11	NDT on fan impellers or runners (Whole impeller)
12	Rotor bar to bar test (consider the number of bars per motor)
13	High voltage test
14	Balancing test
15	Copper material analysis test/check
16	Bearing heat run test and check the bearing temperatures and vibration
17	Bearing insulation test
18	Stator winding temperature measurements
19	Fit new internal fans as and when required
20	Inspect shock absorber rubbers(replace if damaged)
21	Fit new floating lab seals
22	Supply new sight glasses
23	Supply new breathers
24	Supply new pipe work and ball valves
25	Fit new set of O-rings
26	Shotblast, clean and paint the housings
27	Repair journals and landings
28	Burn out stator, remove coils and prepare core for rewind
29	Manufacture new stator coil and insulation rewind kit
30	Overhaul boxes and re-bed brushes
31	Overhaul air to air canopy
32	Replace connector blocks
33	Supply and fit new insulators-triangle type
1	NDT rotor shaft
2	Manufacture new rotor core
3	Remove old rotor core and fit new
4	Machine off rotor short circuiting rings & remove rotor bars
5	Manufacture new rotor bars & short-circuiting rings
7	Re-bar rotor complete
8	Re-insulate DE & NDE bearing housings

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Item No	Description
9	Fit earth lugs
10	Fit new grease pipes & fittings
11	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
12	Manufacture new NDE/DE flinger
13	Re-tap all mounting holes
14	Polish spigots
15	Remove, clean & Re-fit coupling
16	Re-insulate NDE/DE bearing housings
17	Fit new lock washers 110mm
18	Fit new earth brush & holder
19	Repair baffles
20	Overhaul coupling & re-fit
21	Overhaul external fan
22	Skim stator feet
23	Supply & fit new auxiliary terminal box for heaters
24	Light machine flingers & cut new threads
25	Repair rotor shaft threads
26	Manufacture new stator core – stacked & welded
27	Line bore stator core for air gap
28	Machine off rotor end rings & remove rotor bars
29	Manufacture new rotor end rings & rotor bars
30	Microweld & machine NDE/DE inner seal landing in different sizes
31	Microweld & machine NDE/DE outer seal landing in different sizes
32	Microweld & machine NDE/DE external fan landing in different sizes
33	Weld & machine NDE/DE bearing cap
34	Re-tap holes & fit new jacking bolts
35	Supply & fit new jacking bolts
36	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
37	Replace bearing probes
38	Supply & fit new grease pipes & fittings
39	Overhaul fan cowl

13. Extendable Conveyor Drive Motor 185kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the cooler
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul the heaters (replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads-point1)
7	Reinsulate tail leads
	ROTOR

Item No	Description
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
	DE SHIELD/ NDE SHIELD
1	Replace fixing bolts
	BEARINGS
1	Refurbish DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbish NDE bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Replace seals
5	Inspect bearing housing
	ACCESSORIES
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses

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Item No	Description
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Copper analysis test/check
17	Bearing insulation test
18	Stator winding temperature measurements
19	High voltage test
20	Bearing heat run test and check the bearing temperatures and vibration
21	Load test the motor and check efficiency
22	NDT rotor shaft
23	Manufacture new rotor core
24	Remove old rotor core and fit new
25	Machine off rotor short circuiting rings & remove rotor bars
26	Manufacture new rotor bars & short-circuiting rings
27	Re-bar rotor complete
28	Re-insulate DE & NDE bearing housings
29	Fit earth lugs
30	Fit new grease pipes & fittings
31	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
32	Manufacture new NDE/DE flinger
33	Re-tap all mounting holes
34	Polish spigots
35	Remove, clean & Re-fit coupling
36	Re-insulate NDE/DE bearing housings

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Item No	Description
37	Fit new lock washers 110mm
38	Fit new earth brush & holder
39	Repair baffles
40	Overhaul coupling & re-fit
41	Overhaul external fan
42	Skim stator feet
43	Supply & fit new auxiliary terminal box for heaters
44	Light machine flingers & cut new threads
45	Repair rotor shaft threads
45	Manufacture new stator core – stacked & welded
46	Line bore stator core for air gap
47	Machine off rotor end rings & remove rotor bars
48	Manufacture new rotor end rings & rotor bars
49	Microweld & machine NDE/DE inner seal landing in different sizes
50	Microweld & machine NDE/DE outer seal landing in different sizes
51	Microweld & machine NDE/DE external fan landing in different sizes
52	Weld & machine NDE/DE bearing cap
53	Re-tap holes & fit new jacking bolts
54	Supply & fit new jacking bolts
55	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
56	Replace bearing probes
57	Fit new grease pipes & fittings
58	Overhaul fan cowl

14. Auxiliary Cooling Pump Motor 450kW

	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor

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	Description
5	Paint complete motor
TERMINAL BEX AND LEADS	
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
HEAT EXCHANGER	
1	Remove oil from cooler tubes (Clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals
SPACE HEATERS	
1	Test heaters
2	Overhaul the heaters (replace wiring)
2	Replace heaters
STATOR HOUSING	
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads-point1)
7	Reinsulate tail leads
ROTOR	
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)

	Description
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
RESISTANCE TEMPERATURE DETECTOR	
1	PT100 resistance test/ Measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
DE SHIELD AND NDE SHIELD	
1	Replace fixing bolts
ACCESSORIES	
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Perform stator ELCID test on stator
17	Perform rotor core ELCID test
18	NDT on the rotor shaft

	Description
19	NDT on fan impellers or runners (Whole impeller)
20	Perform Rotor bar to bar test (consider the number of bars per motor)
21	High voltage test
22	Balancing test
23	Copper analysis test/check
24	Bearing heat run test and check the bearing temperatures and vibration
25	Stator winding temperature measurements
26	Bearing insulation rest
27	Load test the motor and check efficiency
28	NDT rotor shaft
29	Manufacture new rotor core
30	Remove old rotor core and fit new
31	Machine off rotor short circuiting rings & remove rotor bars
32	Manufacture new rotor bars & short-circuiting rings
33	Re-bar rotor complete
34	Re-insulate DE & NDE bearing housings
35	Fit earth lugs
36	Fit new grease pipes & fittings
37	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
38	Manufacture new NDE/DE flinger
39	Re-tap all mounting holes
40	Polish spigots
41	Remove, clean & Re-fit coupling
42	Re-insulate NDE/DE bearing housings
43	Fit new lock washers 110mm
44	Fit new earth brush & holder
45	Repair baffles
45	Overhaul coupling & re-fit
46	Overhaul external fan
47	Skim stator feet
48	Supply & fit new auxiliary terminal box for heaters
49	Light machine flingers & cut new threads

	Description
50	Repair rotor shaft threads
51	Manufacture new stator core – stacked & welded
52	Line bore stator core for air gap
53	Machine off rotor end rings & remove rotor bars
54	Manufacture new rotor end rings & rotor bars
55	Microweld & machine NDE/DE inner seal landing in different sizes
56	Microweld & machine NDE/DE outer seal landing in different sizes
57	Microweld & machine NDE/DE external fan landing in different sizes
58	Weld & machine NDE/DE bearing cap
33	Re-tap holes & fit new jacking bolts
34	Supply & fit new jacking bolts
35	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
36	Replace bearing probes
37	Fit new grease pipes & fittings
38	Overhaul fan cowl
39	Polish DE/NDE bearing housings to specification
40	Manufacture new grease slinger NDE/DE
41	Supply & fit new DE/NDE bearings, seals @ circlips (NU 322 C3 & 6322 C3)
42	Microweld & machine DE/NDE coupling landing & cut keyway in different sizes
43	Microweld & machine DE/NDE fan landing & cut keyway in different sizes

15. Compressor Motor 310kW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads

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Item No	Description
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the coolers
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Replace heaters
3	Overhaul the heater (Replace wiring)
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads- point1)
7	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity

Item No	Description
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	DE SHIELD/ NDE SHIELD
1	Replace fixing bolts
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
	BEARINGS
1	Refurbish DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbishment NDE bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Replace seals
5	Inspect bearing housing
	ACCESSORIES
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks

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Item No	Description
15	Supply and fit new insulators-triangle type
16	Copper analysis test/check
17	Bearing insulation test
18	High voltage test
19	Stator winding temperature measurements
20	Bearing heat run test and check the bearing temperatures and vibration
21	Load test the motor and check efficiency
22	NDT rotor shaft
23	Manufacture new rotor core
24	Remove old rotor core and fit new
25	Machine off rotor short circuiting rings & remove rotor bars
26	Manufacture new rotor bars & short-circuiting rings
27	Re-bar rotor complete
28	Re-insulate DE & NDE bearing housings
29	Fit earth lugs
30	Fit new grease pipes & fittings
31	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
32	Manufacture new NDE/DE flinger
33	Re-tap all mounting holes
34	Polish spigots
35	Remove, clean & Re-fit coupling
36	Re-insulate NDE/DE bearing housings
37	Fit new lock washers 110mm
38	Fit new earth brush & holder
39	Repair baffles
40	Overhaul coupling & re-fit
41	Overhaul external fan
42	Skim stator feet
43	Supply & fit new auxiliary terminal box for heaters
44	Light machine flingers & cut new threads
45	Repair rotor shaft threads
45	Manufacture new stator core – stacked & welded

Item No	Description
46	Line bore stator core for air gap
47	Machine off rotor end rings & remove rotor bars
48	Manufacture new rotor end rings & rotor bars
49	Microweld & machine NDE/DE inner seal landing in different sizes
50	Microweld & machine NDE/DE outer seal landing in different sizes
51	Microweld & machine NDE/DE external fan landing in different sizes
52	Weld & machine NDE/DE bearing cap
53	Re-tap holes & fit new jacking bolts
54	Supply & fit new jacking bolts
55	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
56	Replace bearing probes
57	Fit new grease pipes & fittings
58	Overhaul fan cowl
59	Polish DE/NDE bearing housings to specification
60	Manufacture new grease slinger NDE/DE
61	Supply & fit new DE/NDE bearings, seals @ circlips (NU 322 C3 & 6322 C3)
62	Microweld & machine DE/NDE coupling landing & cut keyway in different sizes
63	Microweld & machine DE/NDE fan landing & cut keyway in different sizes

16. Extraction Pump Motor 1150kw

	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals

	Description
4	Replace current Electric CT
HEAT EXCHANGER	
1	Remove oil from cooler tubes (clean with solvent)
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the cooler
5	Replace gaskets and seals
SPACE HEATERS	
1	Test heaters
3	Overhaul heaters (replace wiring)
2	Replace heaters
STATOR HOUSING	
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Rectify or correct the stator concentricity
6	Replace tail leads (including terminal box and leads-point1)
7	Reinsulate tail leads
ROTOR	
1	Treat and paint rotor with anti-rust paint
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)

	Description
13	Brazing of rotor end laminations
14	Fit new mag center indicator
	RESISTANCE TEMPERATURE DETECTOR
1	PT100 resistance test/ measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and Bottom of winding per phase)
	DE SHIELD/ NDE SHIELD
1	Replace fixing bolts
	BEARINGS
1	Refurbish DE bearing housing to fit standard bearing refurbishment specifications
2	Refurbishment bearing housing to fit standard bearing refurbishment specifications
3	Replace bearing (see nameplate data supplied on SOW for this motor)
4	Replace seals
5	Inspect bearing housing
	ACCESSORIES
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers (replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Balancing test

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	Description
17	Copper material analysis test/check
18	Bearing insulation test
19	Bearing heat run test and check the bearing temperatures and vibration
20	Stator winding temperature measurements
21	Load test the motor and check efficiency
22	NDT rotor shaft
23	Drill and dowl DE/NDE bearing housings end shield before dismantling
24	Re-sleeve NDE/DE bearing housings
25	Re-fit motor to transport stand
26	Fit new O rings
27	Pressure test second cooler
28	Re-tap all mounting holes
29	Polish DE/NDE caps and flange spigots
30	Clean grease pipe fitting & replace nipples
31	Fit new earth lugs
32	Overhaul internal fan
33	Overhaul stator and spray with insulation varnish
34	Overhaul DE/NDE bearing housings
35	Drill and dell motor and supply new pin
36	Microweld and machine DE/NDE coupling landing and journal in different sizes
37	Microweld & machine NDE/DE inner seal landing in different sizes
38	Microweld & machine NDE/DE outer seal landing in different sizes
39	Microweld & machine NDE/DE external fan landing in different sizes
40	Fit new lock washers (2)
41	Fit new desicator
42	Fit 3 fibre glass inserts
43	Fit new automatic grease feeder 2 off
44	Additional bearing for NDE/DE 7320 C3

17. Forced Cooling Compressor 475KW

Item No	Description
	GENERAL
1	Collect motor from Matimba Power Station
2	Deliver motor to Matimba Power Station
3	Open motor, clean and complete assessment report
4	Assemble motor
5	Paint complete motor
	TERMINAL BOX AND LEADS
1	Replace leads
2	Replace terminal box studs
3	Supply and replace box gaskets and seals
4	Replace current Electric CT
	HEAT EXCHANGER
1	Remove oil from cooler tubes
2	Replace dumping rubbers
3	Overhaul the cooler
4	Pressure test the cooler
5	Replace gaskets and seals
	SPACE HEATERS
1	Test heaters
2	Overhaul heaters(replace wiring)
3	Replace heaters
	STATOR HOUSING
1	Polish stator foot mounting
2	Clean and dry stator
3	Treat and paint stator with anti-rust paint
4	Check the concentricity of the stator
5	Replace tail leads
6	Reinsulate tail leads
	ROTOR
1	Treat and paint rotor with anti-rust paint

Item No	Description
2	Balance rotor at operating speed with fan and half key inserted
3	Polish the journals (NDE)
4	Polish the journals (DE)
5	Polish seal landings (NDE)
6	Polish seal landings (DE)
7	Polish fan landing (DE)
8	Polish fan landing (NDE)
9	Check shaft run out / concentricity
10	Rectify or correct the rotor concentricity
11	Micro welding rotor shaft (DE)
12	Micro welding rotor shaft (NDE)
13	Brazing of rotor end laminations
14	Fit new mag center indicator
RESISTANCE TEMPERATURE DETECTOR	
1	PT100 resistance test/measure RTD
2	Install PT100 on the overhang winding (DE and NDE)
3	Install PT100 on the overhang winding (Top and bottom of winding per phase)
ACCESSORIES	
1	Fit new internal fans as and when required
2	Inspect shock absorber rubbers(replace if damaged)
3	Fit new floating lab seals
4	Supply new sight glasses
5	Supply new breathers
6	Supply new pipe work and ball valves
7	Fit new set of O-rings
8	Shotblast, clean and paint the housings
9	Repair journals and landings
10	Burn out stator, remove coils and prepare core for rewind
11	Manufacture new stator coil and insulation rewind kit
12	Overhaul boxes and re-bed brushes
13	Overhaul air to air canopy

Item No	Description
14	Replace connector blocks
15	Supply and fit new insulators-triangle type
16	Perform and record Polarization test
17	Perform and record Tan Delta test
18	Perform and record off-line Partial Discharge test
19	Perform wedge tightness test on stator
20	Perform stator ELCID test on stator
21	Perform rotor core ELCID test
22	Perform induction test
23	NDT on the rotor shaft
24	NDT on fan impellers or runners (Whole impeller)
25	Perform Rotor bar to bar test (consider the number of bars per rotor)
26	Ultrasonic testing on white metal bearing surface
27	High voltage test
28	Balancing test
29	Copper material analysis test /check
30	Bearing insulation test
31	Bearing heat run test and check the bearing temperatures and vibration
32	Stator winding temperature measurements
33	Load test the motor and check efficiency
33	NDT rotor shaft
34	Manufacture new rotor core
35	Remove old rotor core and fit new
36	Machine off rotor short circuiting rings & remove rotor bars
37	Manufacture new rotor bars & short-circuiting rings
38	Re-bar rotor complete
39	Re-insulate DE & NDE bearing housings
40	Fit earth lugs
41	Fit new grease pipes & fittings
42	Re-insulate bearings cap / Manufacture new NDE/DE bearing cap
43	Manufacture new NDE/DE flinger

Item No	Description
44	Re-tap all mounting holes
45	Polish spigots
45	Remove, clean & Re-fit coupling
46	Re-insulate NDE/DE bearing housings
47	Fit new lock washers 110mm
48	Fit new earth brush & holder
49	Repair baffles
50	Overhaul coupling & re-fit
51	Overhaul external fan
52	Skim stator feet
53	Supply & fit new auxiliary terminal box for heaters
54	Light machine flingers & cut new threads
55	Repair rotor shaft threads
56	Manufacture new stator core – stacked & welded
57	Line bore stator core for air gap
58	Machine off rotor end rings & remove rotor bars
59	Manufacture new rotor end rings & rotor bars
60	Microweld & machine NDE/DE inner seal landing in different sizes
61	Microweld & machine NDE/DE outer seal landing in different sizes
62	Microweld & machine NDE/DE external fan landing in different sizes
63	Weld & machine NDE/DE bearing cap
64	Re-tap holes & fit new jacking bolts
65	Supply & fit new jacking bolts
66	Weld & machine DE/NDE bearing housing bore to suit shaft - cracked
67	Replace bearing probes
68	Fit new grease pipes & fittings
69	Overhaul fan cowl
70	Supplier to additional scope that might be omitted

Item No	Description
1	Perform onsite fault finding as and when required

5. Requirements

Appropriate specifications, procedures and work instructions are used. In the absence of the manufacture's specifications, or Eskom specifications, IEC 60034 shall be used, as appropriate for the class of the motor. Whether using Eskom specifications, national or international specifications, instructions for the testing to be done on each motor are required.

5.1.1 Deficiencies and modifications

No modifications shall be done on the motor without the approval of the employer.

5.1.2 Turnaround time

The maximum turnaround time per motor for assessment shall be three (3) working days. The repair work will depend on the scope of work, which shall be agreed beforehand between Eskom and the supplier, and the scope must indicate timelines per task. When necessary, the employer may request, by telephone or email.

5.1.3 Painting

At least one primer coat and two finish coats of compatible outdoor paint shall be applied in accordance with the paint manufacturer's instructions. Two-part epoxy-type paint is required because of its toughness and durability. (Examples: DuPont's Variprime 615S and 616S). Unless otherwise specified on the Refurbishment form and check sheet, the finish colour shall be emerald grey (G29) on external metal. Coatings: coatings shall be applied in accordance with the manufacture's procedures. Details of coating requirements can be obtained from purchaser's technical contact, if there are not clearly defined on the check sheet.

5.1.4 Record keeping

The supplier will keep originals of the test results, quality and any other documents used on the motor for the period of the contract plus three (3) years.

The Employer shall be given the copy of the tests results.

5.1.5 Data pack

The motor shall be returned to site only if it's accompanied with a data pack comprising as a minimum on the following:

- Failure analysis report.
- Results of the tests specified on the scope of work.

5.1.6 Warranty

Any refurbished motor shall have a 1 year warranty granted by the supplier to the Employer. Warranty shall commence on the day the motor is installed in the plant.

5.1.7 Transport

The supplier is responsible and accountable for transporting the motors from Matimba Power Station to their sites and from their sites to Matimba Power Station. All motors shall be transported as per Eskom 240-56361435: Transportation of power station electric motors standard.

5.1.8 Quality

The supplier provides a complete Quality Control Plan in accordance with the requirements of ISO 9001:2008 to the Employer for approval. This plan must ensure an integrated quality service as part of the contract. All quality hold point and witness point must be done in the presence of an Eskom employee. Quality documents to be handed over to the Employer. The final motor test at the factory test bay must be done with the employer's representative present.

5.1.9 Adherence to Eskom generic policies

The supplier employees shall comply with Eskom's policies and site regulations, including but not limited to, use of cell phones in restricted areas, adherence to Eskom's lifesaving rules, smoking policy, zero tolerance on alcohol usage etc. These requirements will be detailed during the induction training process.

5.1.10 Quality control standards:

Quality control plan shall be produced, maintained and implemented per task as agreed by the employer. The QCP must be discussed with the employer for approval. This QCP shall comply with ISO 9001:2008 standards. Any amendments to the QCP shall be discussed with the employer for approval.

5.1.11 Special tests and investigations

The supplier will perform special tests, investigations and recordings of all findings. The findings shall be shared with the Employer.

5.1.12 Insurance

All motors insurance shall be covered by the supplier as from the time they leave Employer's site until delivered back on the Employer's site.

5.1.13 Quotations

All quotations shall be given in South African Rands (ZAR).

5.1.14 Industrial Relation

Any industrial relations issues from the supplier should be discussed with the contract manager.

5.1.15 Program

A detailed program should be drafted in the form of bar chart or any software that will specify the plan and progress of repairs and be submitted to the contract manager together with the quotation. Contract manager and System Engineer must have opportunity to influence the bar chart for holding points. Employer can send any personnel to witness holding points and if it happens that the witness cannot be done, the supplier will only proceed after approval from the Employer.

5.1.16 Deviations

Non-compliance from the agreement will result in NCR being issued to the supplier and when the third NCR is issued, the supplier will be referred to the supplier reconciliation committee.

6. Acceptance

This document has been seen and accepted by:

Name & Surname	Designation
Gwadamani Sehlako	Senior Supervisor
Elton Lemboe	Middle Manager Maintenance
Adriaan Besseling	Electrical Maintenance Manager
Antony Matlawa	C & I Maintenance Manager
Boleo Lesejane	System Engineer
Louisa Bamuzza	Manager Elec Heavy Current
Marubini Manyage	Chief Engineer Prof Engineering
Hennie Pretorius	Senior Advisor Engineering
Moses Yabo	Engineer Prof Engineering
Riaan Nel	Manager Engineering

7. Revisions

Date	Rev.	Compiler	Remarks
October 2024	2	G Sehlako	To act as an instruction to service provider for the refurbishment of MV Motors.

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8. Development Team

Virginia Sbango

9. Acknowledgements

N/A