GEARBOX REPAIR AND REFURBISHMENT

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
	This cover page	1
C3.1	*Employer*'s Service Information	
C3.2	*Contractor*'s Service Information	
	Total number of pages	42

Contents

C3.1: EMPLOYER'S SERVICE INFORMATION

Contents

1 Description of the *Service*

1.1 Executive Overview

This document provides the Eskom requirements for the Supply, refurbishment and repair of different types of gearboxes at Majuba Power Stations Ash and Coal Plants on an as and when required Basis. It covers the requirements for the stripping and assessment, redesign of weak features, general updating of design in accordance with modern design practise, repair, inspection, testing and certification of repaired gearboxes will the required base standard.

While this document contains quality control and assurance requirements, it does not cover all material and workmanship issues that shall be addressed by the *Repairer* through a duly certified ISO 9001: 2015 Quality Management System.

The *Contractor* shall have an effective quality management system in place and be ISO 9001 certified. Furthermore, all activities will be done as per the level of quality management stipulated therein and also taking into account input from Majuba Engineering Section, Risk assurance department and Management.

The *Contractor* provides qualified and competent teams with all the necessary equipment and properly equipped Worksop to provide the Service.

The *Contractor* shall identify a representative as a key person that will be approved by the *Employer* who will report to the Service manager and co-ordinate all activities. The Site representative shall be a qualified and experienced person.

The *Contractor* shall ensure that the contracted service is performed regardless of strike and industrial action.

The Contractor keeps at his works spares in stock for the repair of a least 2 of each Item to be repaired

1.2 *Employer*'s Supply, Repair and Refurbishment *Service* Requirements

Different types of gearboxes.

1	692491	**Refurbish** GEARBOX: TYPE: REDUCTION; RATIO: 22.2:1; SPEED: 1490 RPM; POWER: 630 KW; APPLICATION: TIPPLER TAKE OUT CONVEYOR BELT DRIVE; ROTATION DIRECTION: CLOCKWISE/ANTI-CLOCKWISE; OEM P/N: RC2I 5000UOIF/22.2B; FRAME 5E; RC2I500.
2	692491	**Supply and deliver** GEARBOX: TYPE: REDUCTION; RATIO: 22.2:1; SPEED: 1490 RPM; POWER: 630 KW; APPLICATION: TIPPLER TAKE OUT CONVEYOR BELT DRIVE; ROTATION DIRECTION: CLOCKWISE/ANTI-CLOCKWISE; OEM P/N: RC2I 5000UOIF/22.2B; FRAME 5E; RC2I500
3	214615	**Refurbish Dumper Falk gearbox.** GEARBOX: TYPE: REDUCTION; RATIO: 50.15:1; SPEED: 1500/29.9 RPM; POWER: 55 KW; SUPPL P/N: FALK 425A.
4	214615	**Supply and deliver Dumper Falk gearbox.** GEARBOX: TYPE: REDUCTION; RATIO: 50.15:1; SPEED: 1500/29.9 RPM; POWER: 55 KW; SUPPL P/N: FALK 425A.
5	223082	**Refurbish Magnet drive D - 60mm (Tippler incl, Bin feed, Reclaim)** MOTOR, GEARED: POWER: 7.5 KW; CURRENT: 15 A; OUTPUT SPEED: 130 RPM; RATIO: 11.15:1; POTENTIAL: 380 V; MOTOR SPEED: 1450 RPM; MOUNTING: BOLTED; ENCLOSURE RATING: IP55; SHAFT: 60 MM; POLES: 4; SUPPL P/N: 0609-M24094; REFERENCE NO: CAD88-M132M4; MTG: H-01-A-2A; MAGNETIC SEPERATOR; HOLLOW OUTPUT; SHAFT: 60 MM WITH STANDARD KEY WAY; FLENDER BRAND; 1.7 L; DELTA CONNECTION; 50 HZ; THE UNIT MUST BE DELIVERED WITH A STANDARD TORQUE ARM
6	223082	**Supply and deliver Magnet drive D - 60mm (Tippler incl, Bin feed, Reclaim)** MOTOR, GEARED: POWER: 7.5 KW; CURRENT: 15 A; OUTPUT SPEED: 130 RPM; RATIO: 11.15:1; POTENTIAL: 380 V; MOTOR SPEED: 1450 RPM; MOUNTING: BOLTED; ENCLOSURE RATING: IP55; SHAFT: 60 MM; POLES: 4; SUPPL P/N: 0609-M24094; REFERENCE NO: CAD88-M132M4; MTG: H-01-A-2A; MAGNETIC SEPERATOR; HOLLOW OUTPUT; SHAFT: 60 MM WITH STANDARD KEY WAY; FLENDER BRAND; 1.7 L; DELTA CONNECTION; 50 HZ; THE UNIT MUST BE DELIVERED WITH A STANDARD TORQUE ARM
7	177059	**Refurbish Bin feed gearbox.** GEARBOX: TYPE: SPEED REDUCER; RATIO: 16.794:1; SPEED: 1487/8.54 RPM; POWER: 650 KW; REFERENCE NO: K3C450-11; BEW GEAR.
8	177059	**Supply and deliver Bin feed gearbox.** GEARBOX: TYPE: SPEED REDUCER; RATIO: 16.794:1; SPEED: 1487/8.54 RPM; POWER: 650 KW; REFERENCE NO: K3C450-11; BEW GEAR.
9	681347	**Refurbish Overland link Conveyor**. GEARBOX: TYPE: REDUCTION; RATIO: 20.69:1; SPEED: 1485 RPM; POWER: 200 KW; APPLICATION: STACKER LINK CONVEYOR BELT DRIVE; ROTATION DIRECTION:

		BIDIRECTIONAL; MANUF P/N: RCI 321 U02A-163 B3.
10	681347	**Supply and deliver Overland link Conveyor**. GEARBOX: TYPE: REDUCTION; RATIO: 20.69:1; SPEED: 1485 RPM; POWER: 200 KW; APPLICATION: STACKER LINK CONVEYOR BELT DRIVE; ROTATION DIRECTION: BIDIRECTIONAL; MANUF P/N: RCI 321 U02A-163 B3.
11	215422	**Refurbish Tripper car long travel.** MOTOR, GEARED: MOTOR TYPE: LONG TRAVEL; SUPPL P/N: BK40-64V/D09LA4-S/2008B9SP; TYPE LONG TRAVEL; MUST BE SUPPLIED WITH THE FOLLOWING 1 X BEVEL GEARED MOTOR PART NO BK40 - 64 U / D09 LA 4 - S / Z 008 B9 SP; 1 X DRIVE SHAFT PART NO STAC 124 569. WS; 2 X ROD ENDS PART NO GIR 30.DO. 2RS; 1 X HOUSING STAC 22214.BSE; 1 X HOUSING STAC 22214.BSF; 1 X THREADED BAR M30X300X2MM; 2 X BEARING 22214.RHRW33C3
12	215422	**Supply and deliver Tripper car long travel.** MOTOR, GEARED: MOTOR TYPE: LONG TRAVEL; SUPPL P/N: BK40-64V/D09LA4-S/2008B9SP; TYPE LONG TRAVEL; MUST BE SUPPLIED WITH THE FOLLOWING 1 X BEVEL GEARED MOTOR PART NO BK40 - 64 U / D09 LA 4 - S / Z 008 B9 SP; 1 X DRIVE SHAFT PART NO STAC 124 569. WS; 2 X ROD ENDS PART NO GIR 30.DO. 2RS; 1 X HOUSING STAC 22214.BSE; 1 X HOUSING STAC 22214.BSF; 1 X THREADED BAR M30X300X2MM; 2 X BEARING 22214.RHRW33C3
13	593151	**Refurbish Plough gearbox.** GEARBOX: TYPE: REDUCER; RATIO: 95:1; SPEED: I/P 1475; O/P 15.5 RPM; POWER: 75 KW; SHAFT SIZE: I/P 50 X O/P 239.5 MM; APPLICATION: PLOUGH WHEEL; ROTATION DIRECTION: CLOCKWISE; SUPPL P/N: K4V400F.
14	593151	**Supply and deliver Plough gearbox.** GEARBOX: TYPE: REDUCER; RATIO: 95:1; SPEED: I/P 1475; O/P 15.5 RPM; POWER: 75 KW; SHAFT SIZE: I/P 50 X O/P 239.5 MM; APPLICATION: PLOUGH WHEEL; ROTATION DIRECTION: CLOCKWISE; SUPPL P/N: K4V400F.
15	217274	**Refurbish Plough long travel gearbox.** MOTOR, GEARED: POWER: 1.1 KW; CURRENT: 2.89 A; OUTPUT SPEED: 4.4 RPM; RATIO: 324.8:1; POTENTIAL: 380 V; MOTOR SPEED: 1390 RPM; MOUNTING: B5; ENCLOSURE RATING: IP55; PHASE: 3; ACCESSORIES: MOTOR; GEARBOX; CONNECTION LOCATION: Y/D; POLES: 4; SERVICE FACTOR: 1.3; SUPPL P/N: AG63-12/D/C94-24/BR; GEARBOX MUST BE FILLED WITH IEC ADAPTOR FOR EASE OF FITMENT OF ANY STANDARD IEC ELECTRIC MOTOR; LONG TRAVEL PLOUGH
16	217274	**Supply and deliver Plough long travel gearbox.** MOTOR, GEARED: POWER: 1.1 KW; CURRENT: 2.89 A; OUTPUT SPEED: 4.4 RPM; RATIO: 324.8:1; POTENTIAL: 380 V; MOTOR SPEED: 1390 RPM; MOUNTING: B5; ENCLOSURE RATING: IP55; PHASE: 3; ACCESSORIES: MOTOR; GEARBOX; CONNECTION LOCATION: Y/D; POLES: 4; SERVICE FACTOR: 1.3; SUPPL P/N: AG63-12/D/C94-24/BR; GEARBOX MUST BE FILLED WITH IEC ADAPTOR FOR EASE OF FITMENT OF ANY STANDARD IEC ELECTRIC MOTOR; LONG TRAVEL PLOUGH
17	215497	**Refurbish Cross gearbox**. GEARBOX: TYPE: REDUCTION; RATIO: 13.48:1; SPEED: 1475 RPM; POWER: 45 KW; APPLICATION: CROSS CONVEYOR DRIVE TRAIN; ROTATION DIRECTION: CLOCKWISE; SUPPL P/N: K140A (225); REFERENCE NO: 9403-9656; MOUNTING: FOOT; INPUT SHAFT: DIA 60MM; OUTPUT SHAFT: DIA 90MM; DUAL OUTPUT SHAFT FITTED WITH INTERNAL BACKSTOP; OIL

		SIGHTGLASS; OIL SAMPLING POINT; MOTOR POWER: 45KW; 380V; 1475RPM; FLENDER; PAINT: SKYBLUE.
18	215497	**Supply and deliver Cross gearbox**. GEARBOX: TYPE: REDUCTION; RATIO: 13.48:1; SPEED: 1475 RPM; POWER: 45 KW; APPLICATION: CROSS CONVEYOR DRIVE TRAIN; ROTATION DIRECTION: CLOCKWISE; SUPPL P/N: K140A (225); REFERENCE NO: 9403-9656; MOUNTING: FOOT; INPUT SHAFT: DIA 60MM; OUTPUT SHAFT: DIA 90MM; DUAL OUTPUT SHAFT FITTED WITH INTERNAL BACKSTOP; OIL SIGHTGLASS; OIL SAMPLING POINT; MOTOR POWER: 45KW; 380V; 1475RPM; FLENDER; PAINT: SKYBLUE.
19	210162	**Refurbish Cross M/H gearbox.** ASSEMBLY: TYPE: REDUCER DRIVE; APPLICATION: MOVING HEAD DRIVE TRAIN; MATERIAL: STEEL; COMPRISING: GEARBOX; MAGNETIC BRAKE; MOTOR; SUPPL P/N: K108W100LI4-L32; FLENDER GEARBOX; MOTOR 5.5 KW; 380V; BRAKED MOTOR; OUTPUT 13.4 RPM; OUTPUT SHAFT DIA 60 MM; DULE OUTPUT SHAFT FOR BOTH LEFT AND RIGHT HAND SIDE DRIVE; DIRECTION OF ROTATION = REVERSABLE WITH FORWARD DIRECTION WHEN MOTOR ROTATES CLOCKWISE; IP 55; PAINT SPEC = BLUE
20	210162	**Supply and deliver Cross M/H gearbox.** ASSEMBLY: TYPE: REDUCER DRIVE; APPLICATION: MOVING HEAD DRIVE TRAIN; MATERIAL: STEEL; COMPRISING: GEARBOX; MAGNETIC BRAKE; MOTOR; SUPPL P/N: K108W100LI4-L32; FLENDER GEARBOX; MOTOR 5.5 KW; 380V; BRAKED MOTOR; OUTPUT 13.4 RPM; OUTPUT SHAFT DIA 60 MM; DULE OUTPUT SHAFT FOR BOTH LEFT AND RIGHT HAND SIDE DRIVE; DIRECTION OF ROTATION = REVERSABLE WITH FORWARD DIRECTION WHEN MOTOR ROTATES CLOCKWISE; IP 55; PAINT SPEC = BLUE
21	692482	**Refurbish Boiler incline M/H drive.** MOTOR, GEARED: POWER: 5.5 KW; CURRENT: 11.25 A; OUTPUT SPEED: 26 RPM; RATIO: 36.44:1; POTENTIAL: 380 V; MOTOR SPEED: 960 RPM; MOUNTING: H01-A-1A; ENCLOSURE RATING: IP55; PHASE: 3; DIRECTION: CLOCKWISE/ANTI-CLOCKWISE; INSULATION CLASS: IP55; SHAFT: DIA 60 MM; POLES: 6; BOILER INCLINE MOVING HEAD DRIVE: DUAL OUTPUT SHAFT; PAINT SKY BLUE; C/W BRAKE; PRESERVED FOR LONGTERM STORAGE; REDUCE DRIVE FLENDER GEARBOX WITH BRAKE MODEL K108-M132-584
22	692482	**Supply and deliver Boiler incline M/H drive.** MOTOR, GEARED: POWER: 5.5 KW; CURRENT: 11.25 A; OUTPUT SPEED: 26 RPM; RATIO: 36.44:1; POTENTIAL: 380 V; MOTOR SPEED: 960 RPM; MOUNTING: H01-A-1A; ENCLOSURE RATING: IP55; PHASE: 3; DIRECTION: CLOCKWISE/ANTI-CLOCKWISE; INSULATION CLASS: IP55; SHAFT: DIA 60 MM; POLES: 6; BOILER INCLINE MOVING HEAD DRIVE: DUAL OUTPUT SHAFT; PAINT SKY BLUE; C/W BRAKE; PRESERVED FOR LONGTERM STORAGE; REDUCE DRIVE FLENDER GEARBOX WITH BRAKE MODEL K108-M132-584
23	670309	**Refurbish Boiler incline M/H drive.** MOTOR, GEARED: POWER: 5.5 KW; CURRENT: 11.25 A; OUTPUT SPEED: 26 RPM; RATIO: 36.44:1; POTENTIAL: 380 V; MOTOR SPEED: 960 RPM; MOUNTING: FOOT; ENCLOSURE RATING: IP55; PHASE: 3; GEARBOX TYPE: FLENDER; DIRECTION: BI-DIRECTIONAL; SHAFT: DIA 60 MM; POLES: 6; MODEL NO: K108-M132-S84; DRIVE MUST HAVE DUAL OUTPUT SHAFTS

		PRESERVED FOR LONG TERM STORAGE; REDUCE DRIVE; FLENDER GEARBOX WITH BRAKE; PAINT SPEC: SKY BLUE
24	670309	**Supply and deliver Boiler incline M/H drive.** MOTOR, GEARED: POWER: 5.5 KW; CURRENT: 11.25 A; OUTPUT SPEED: 26 RPM; RATIO: 36.44:1; POTENTIAL: 380 V; MOTOR SPEED: 960 RPM; MOUNTING: FOOT; ENCLOSURE RATING: IP55; PHASE: 3; GEARBOX TYPE: FLENDER; DIRECTION: BI-DIRECTIONAL; SHAFT: DIA 60 MM; POLES: 6; MODEL NO: K108-M132-S84; DRIVE MUST HAVE DUAL OUTPUT SHAFTS PRESERVED FOR LONG TERM STORAGE; REDUCE DRIVE; FLENDER GEARBOX WITH BRAKE; PAINT SPEC: SKY BLUE
25	256310	**Refurbish Bin link 37 kw.** GEARBOX: TYPE: REDUCTION; RATIO: 13:48:1; SPEED: 109 RPM; POWER: 37 KW; SHAFT SIZE: 60 X 90 MM; APPLICATION: CONVEYOR DRIVE TRAIN; ROTATION DIRECTION: FORWARD; SUPPL P/N: KD140-K2-225X; SHOULD BE FITTED WITH A BACKSTOP DEVICE; MOUNTING B3-A, OIL 11 L; NO KEYWAYS ON OUTPUT SHAFT; BELL HOUSING; OIL SIGHT GLASS; OIL SAMPLING POINT; FOR 10ECB1020ECB50; PAINT: SKY BLUE; SHAFT PRESERVED FOR LONG TERM STORAGE.
26	256310	**Supply and deliver Bin link 37 kw.** GEARBOX: TYPE: REDUCTION; RATIO: 13:48:1; SPEED: 109 RPM; POWER: 37 KW; SHAFT SIZE: 60 X 90 MM; APPLICATION: CONVEYOR DRIVE TRAIN; ROTATION DIRECTION: FORWARD; SUPPL P/N: KD140-K2-225X; SHOULD BE FITTED WITH A BACKSTOP DEVICE; MOUNTING B3-A, OIL 11 L; NO KEYWAYS ON OUTPUT SHAFT; BELL HOUSING; OIL SIGHT GLASS; OIL SAMPLING POINT; FOR 10ECB1020ECB50; PAINT: SKY BLUE; SHAFT PRESERVED FOR LONG TERM STORAGE.
27	224092	**Refurbish Bin feed 30 kw.** ASSEMBLY: TYPE: CONVEYOR DRIVE TRAIN; APPLICATION: DRIVING CONVEYOR; SUPPL P/N: 0609-M24067; K148-K2-200; ASSEMBLY; RATIO 13:00:1; N2; 112 RPM; MTG B3-B-2A; MTR 30 KW; 380 V; DELTA CONNECTION; IP55; 4 POLE; FOR 02ECB13AF100 AND 02ECB23AF100; OUTPUT SHAFT NO KEYWAY; INPUT SHAFT DIA 60 MM; OUTPUT SHAFT 90 MM; FOOT MOUNT; BELL HOUSING: NO BACK STOP; DUAL OUTPUT SHAFT; OIL SIGHT GLASS, SAMPLING POINT; PAINT ORANGE; SHAFTS PRESERVE FOR LONGTERM STORAGE
28	224092	**Supply and deliver Bin feed 30 kw.** ASSEMBLY: TYPE: CONVEYOR DRIVE TRAIN; APPLICATION: DRIVING CONVEYOR; SUPPL P/N: 0609-M24067; K148-K2-200; ASSEMBLY; RATIO 13:00:1; N2; 112 RPM; MTG B3-B-2A; MTR 30 KW; 380 V; DELTA CONNECTION; IP55; 4 POLE; FOR 02ECB13AF100 AND 02ECB23AF100; OUTPUT SHAFT NO KEYWAY; INPUT SHAFT DIA 60 MM; OUTPUT SHAFT 90 MM; FOOT MOUNT; BELL HOUSING: NO BACK STOP; DUAL OUTPUT SHAFT; OIL SIGHT GLASS, SAMPLING POINT; PAINT ORANGE; SHAFTS PRESERVE FOR LONGTERM STORAGE
29	256311	**Refurbish Bin feed 18.5 kw.** GEARBOX: TYPE: REDUCTION; RATIO: 13:45:1; SPEED: 110 RPM; POWER: 18.5 KW; SHAFT SIZE: 48 X 70 MM; APPLICATION: CONVEYOR DRIVE TRAIN; ROTATION DIRECTION: LH/RH; SUPPL P/N: K120-K2-180X; MOUNTING B3-B, OIL 7.5 L, NO KEYWAY ON OUTPUT SHAFT TO DIN 6885-1, OUTPUT SHAFT SHOULD BE A DUAL SHAFT WITH COVER; NO INTERNAL BACK STOP; OIL SIGHT GLASS; OIL SAMPLING POINT; PAINT: SKY

		BLUE; BELL HOUSING; SHAFTS PRESERVED; LONG TERM STORAGE; FOR HORIZONTAL BIN FEEDS; TERRACE LOAD.
30	256311	**Supply and deliver Bin feed 18.5 kw.** GEARBOX: TYPE: REDUCTION; RATIO: 13:45:1; SPEED: 110 RPM; POWER: 18.5 KW; SHAFT SIZE: 48 X 70 MM; APPLICATION: CONVEYOR DRIVE TRAIN; ROTATION DIRECTION: LH/RH; SUPPL P/N: K120-K2-180X; MOUNTING B3-B, OIL 7.5 L, NO KEYWAY ON OUTPUT SHAFT TO DIN 6885-1, OUTPUT SHAFT SHOULD BE A DUAL SHAFT WITH COVER; NO INTERNAL BACK STOP; OIL SIGHT GLASS; OIL SAMPLING POINT; PAINT: SKY BLUE; BELL HOUSING; SHAFTS PRESERVED; LONG TERM STORAGE; FOR HORIZONTAL BIN FEEDS; TERRACE LOAD.
31	210110	**Refurbish Moving Head, K128-W100LI4-L32,[Fender/Siement].** MOTOR, GEARED: POWER: 3 KW; CURRENT: 6.4 A; OUTPUT SPEED: 12.7 RPM; RATIO: 114.34:1; POTENTIAL: 380 VAC; MOTOR SPEED: 1400 RPM; MOUNTING: H01-A-1A; ENCLOSURE RATING: IP55; INSULATION CLASS: IP55; SHAFT: DIA 70 MM; SUPPL P/N: K128-W100LI4-L32; THE DRIVE MUST HAVE DUAL OUTPUT SHAFTS; REDUCER DRIVE; WITH FLENDER GEARBOX; WITH BRAKE; PAINT SPEC ORANGE
32	210110	**Supply and deliver moving Head, K128-W100LI4-L32,[Fender/Siement].** MOTOR, GEARED: POWER: 3 KW; CURRENT: 6.4 A; OUTPUT SPEED: 12.7 RPM; RATIO: 114.34:1; POTENTIAL: 380 VAC; MOTOR SPEED: 1400 RPM; MOUNTING: H01-A-1A; ENCLOSURE RATING: IP55; INSULATION CLASS: IP55; SHAFT: DIA 70 MM; SUPPL P/N: K128-W100LI4-L32; THE DRIVE MUST HAVE DUAL OUTPUT SHAFTS; REDUCER DRIVE; WITH FLENDER GEARBOX; WITH BRAKE; PAINT SPEC ORANGE
33	666945	**Refurbish Magnet drive D - 50mm (Boiler incl).** MOTOR, GEARED: POWER: 7.5 KW; CURRENT: 15 A; OUTPUT SPEED: 130 RPM; RATIO: 11.15:1; POTENTIAL: 380 V; MOTOR SPEED: 1450 RPM; MOUNTING: BOLTED; ENCLOSURE RATING: IP55; ACCESSORIES: STABILIZING ARM; SHAFT: 50 MM; POLES: 4; MAGNETIC SEPARATOR BOILER INCLINE CONVEYOR; 50 HZ; STANDARD TORQUE ARM
34	666945	**Supply and deliver Magnet drive D - 50mm (Boiler incl).** MOTOR, GEARED: POWER: 7.5 KW; CURRENT: 15 A; OUTPUT SPEED: 130 RPM; RATIO: 11.15:1; POTENTIAL: 380 V; MOTOR SPEED: 1450 RPM; MOUNTING: BOLTED; ENCLOSURE RATING: IP55; ACCESSORIES: STABILIZING ARM; SHAFT: 50 MM; POLES: 4; MAGNETIC SEPARATOR BOILER INCLINE CONVEYOR; 50 HZ; STANDARD TORQUE ARM
35	231607	**Refurbish Transverse Gearbox.** GEARBOX: RATIO: 21.90:1; SPEED: 68 RPM; POWER: 45 KW; APPLICATION: ASH STACKER; SUPPL P/N: K168-A-225;
36	231607	**Supply and deliver Transverse Gearbox.** GEARBOX: RATIO: 21.90:1; SPEED: 68 RPM; POWER: 45 KW; APPLICATION: ASH STACKER; SUPPL P/N: K168-A-225;
37	210162	**Refurbish Cross M/H gearbox**. ASSEMBLY: TYPE: REDUCER DRIVE; APPLICATION: MOVING HEAD DRIVE TRAIN; MATERIAL: STEEL; COMPRISING: GEARBOX; MAGNETIC BRAKE; MOTOR; SUPPL P/N: K108W100LI4-L32; LENDER GEARBOX; MOTOR 5.5 KW; 380V;

		BRAKED MOTOR; OUTPUT 13.4 RPM; OUTPUT SHAFT DIA 60 MM; DULE OUTPUT SHAFT FOR BOTH LEFT AND RIGHT HAND SIDE DRIVE; DIRECTION OF ROTATION = REVERSABLE WITH FORWARD DIRECTION WHEN MOTOR ROTATES CLOCKWISE; IP 55; PAINT SPEC = BLUE
38	210162	**Supply and deliver Cross M/H gearbox**. ASSEMBLY: TYPE: REDUCER DRIVE; APPLICATION: MOVING HEAD DRIVE TRAIN; MATERIAL: STEEL; COMPRISING: GEARBOX; MAGNETIC BRAKE; MOTOR; SUPPL P/N: K108W100LI4-L32; LENDER GEARBOX; MOTOR 5.5 KW; 380V; BRAKED MOTOR; OUTPUT 13.4 RPM; OUTPUT SHAFT DIA 60 MM; DULE OUTPUT SHAFT FOR BOTH LEFT AND RIGHT HAND SIDE DRIVE; DIRECTION OF ROTATION = REVERSABLE WITH FORWARD DIRECTION WHEN MOTOR ROTATES CLOCKWISE; IP 55; PAINT SPEC = BLUE
37	187357	**Refurbish Stacker Feed Gearbox.** GEARBOX: TYPE: BEVEL; RATIO: 12.61:1; SPEED: 1430/64 RPM; SUPPL P/N: K160P(250)-X; B3-B MOUNTING, CW BACKSTOP, SPECIAL SHAFT. .
38	187357	**Supply and deliver Stacker Feed Gearbox.** GEARBOX: TYPE: BEVEL; RATIO: 12.61:1; SPEED: 1430/64 RPM; SUPPL P/N: K160P(250)-X; B3-B MOUNTING, CW BACKSTOP, SPECIAL SHAFT.
39	595468	**Refurbish Conditioner Gearbox.** GEARBOX: TYPE: CONDITIONER; RATIO: 45:1; SPEED: 1475/33.3 RPM; POWER: 40 KW; SHAFT SIZE: I/P 45 X O/P 125 MM; APPLICATION: ASH CONDITIONER; SUPPL P/N: IBA5010116.2010, BA730009.2012; REFERENCE NO: JKD4505285166.01001; HOLLOW OUTPUT SHAFT.
40	595468	**Supply and deliver Conditioner Gearbox.** GEARBOX: TYPE: CONDITIONER; RATIO: 45:1; SPEED: 1475/33.3 RPM; POWER: 40 KW; SHAFT SIZE: I/P 45 X O/P 125 MM; APPLICATION: ASH CONDITIONER; SUPPL P/N: IBA5010116.2010, BA730009.2012; REFERENCE NO: JKD4505285166.01001; HOLLOW OUTPUT SHAFT.
41	592669	**Refurbish** OVERLAND GEARBOX 250KW. GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 16:1; SPEED: 1490/969 RPM; POWER: 228 KW; SHAFT SIZE: I/P 75 X O/P 155 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRF.
42	592669	**Supply and deliver** OVERLAND GEARBOX 250KW. GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 16:1; SPEED: 1490/969 RPM; POWER: 228 KW; SHAFT SIZE: I/P 75 X O/P 155 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRF.
43	592671	**Refurbish** LINK CONVEYOR 75KW. GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 12.1; SPEED: 1488/132 RPM; POWER: 58 KW; SHAFT SIZE: I/P 45 X O/P 90 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRB2; SF: 57 WITH BACKLOCK.
44	592671	**Supply and deliver** LINK CONVEYOR 75KW. GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 12.1; SPEED: 1488/132 RPM; POWER: 58 KW; SHAFT SIZE: I/P 45 X O/P 90 MM; APPLICATION: CONVEYOR

		DRIVE; REFERENCE NO: QHRB2; SF: 57 WITH BACKLOCK.
45	176965	**Refurbish** Cooling Tower Fan, Hansen gearbox. GEARBOX: TYPE: REDUCTION; RATIO: 9:1; SPEED: 1480-163.4/740-81.7 RPM; POWER: 180 KW; APPLICATION: COOLING TOWER FAN; HANSEN.
46	176965	**Supply and deliver** Cooling Tower Fan, Hansen gearbox. GEARBOX: TYPE: REDUCTION; RATIO: 9:1; SPEED: 1480-163.4/740-81.7 RPM; POWER: 180 KW; APPLICATION: COOLING TOWER FAN; HANSEN.
47	177058	**Refurbish** Feeder Gearbox. GEARBOX: TYPE: SPEED REDUCER; RATIO: 70:1; SPEED: 1485/21.21 RPM; POWER: 75 KW; REFERENCE NO: K3C355; BEW GEAR.
48	177058	**Supply and deliver** Feeder Gearbox. GEARBOX: TYPE: SPEED REDUCER; RATIO: 70:1; SPEED: 1485/21.21 RPM; POWER: 75 KW; REFERENCE NO: K3C355; BEW GEAR
49	215777	**Refurbish Stacker and reclaim**. GEARBOX: TYPE: REDUCTION; RATIO: 16.919:1; SPEED: 1481 RPM; POWER: 300 KW; SHAFT SIZE: 165 MM; APPLICATION: CONVEYOR DRIVE; ROTATION DIRECTION: CLOCKWISE FROM INPUT; MODEL NO: TRA63.
50	215777	**Supply and deliver Stacker and reclaim**. GEARBOX: TYPE: REDUCTION; RATIO: 16.919:1; SPEED: 1481 RPM; POWER: 300 KW; SHAFT SIZE: 165 MM; APPLICATION: CONVEYOR DRIVE; ROTATION DIRECTION: CLOCKWISE FROM INPUT; MODEL NO: TRA63.
51	215775	**Refurbish Stacker shuttle.** GEARBOX: TYPE: REDUCTION; RATIO: 32.6:1; SPEED: 1480 RPM; POWER: 55 KW; MODEL NO: TRA5-45; DAVID BROWN.
52	215775	**Supply and deliver Stacker Stacker shuttle.** GEARBOX: TYPE: REDUCTION; RATIO: 32.6:1; SPEED: 1480 RPM; POWER: 55 KW; MODEL NO: TRA5-45; DAVID BROWN.
53	215773	**Refurbish Overland gearbox (Model Number TRA 91).** GEARBOX: TYPE: REDUCTION; RATIO: 23.795:1; SPEED: 1483 RPM; POWER: 600 KW; MODEL NO: TRA91; DAVID BROWN.
54		**Supply and deliver Stacker Overland gearbox (Model Number TRA 91).** GEARBOX: TYPE: REDUCTION; RATIO: 23.795:1; SPEED: 1483 RPM; POWER: 600 KW; MODEL NO: TRA91; DAVID BROWN.
55	215774	**Refurbish Boiler incline gearbox (Model Number TRA 63).** GEARBOX: TYPE: REDUCTION; RATIO: 19.088:1; SPEED: 1488 RPM; POWER: 300 KW; APPLICATION: CONVEYOR DRIVE; ROTATION DIRECTION: FORWARD; MODEL NO: TRA63; DUAL OUTPUT SHAFT DIMENSIONS: DIA 165 X LG 187MM; NO KEY WAYS REQUIRED ON SHAFT, IT MUST BE PRESEVED WITH DENSO TAPE; THE GEARBOX MUST HAVE A HAND OPERATED BALL VALVE ON THE OIL DRAIN.

56	215774	**Supply and deliver Stacker Boiler incline gearbox (Model Number TRA 63).** GEARBOX: TYPE: REDUCTION; RATIO: 19.088:1; SPEED: 1488 RPM; POWER: 300 KW; APPLICATION: CONVEYOR DRIVE; ROTATION DIRECTION: FORWARD; MODEL NO: TRA63; DUAL OUTPUT SHAFT DIMENSIONS: DIA 165 X LG 187MM; NO KEY WAYS REQUIRED ON SHAFT, IT MUST BE PRESEVED WITH DENSO TAPE; THE GEARBOX MUST HAVE A HAND OPERATED BALL VALVE ON THE OIL DRAIN.
57	215975	**Refurbish Overland Gearbox (Model Number TRA 63**). GEARBOX: TYPE: REDUCTION; RATIO: 17.93:1; SPEED: 1473/85 RPM; POWER: 250 KW, DOUBLE SIDED OUTPUT SHAFT.
58	215975	**Supply and deliver Overland Gearbox Model Number TRA 63**). GEARBOX: TYPE: REDUCTION; RATIO: 17.93:1; SPEED: 1473/85 RPM; POWER: 250 KW; DOUBLE SIDED OUTPUT SHAFT.
59	175974	**Refurbish** GEARBOX: TYPE: REDUCTION; RATIO: VARIABLE; SPEED: 2700/3100/3400/4000 RPM; POWER: 55 KW; SUPPL P/N: ET3600FS; BREVIN 3 STAGE, FLANGED MOUNT, TORQUE 5000 NM, EFFIENCY 90 PCT.
60	175974	**Supply and deliver** GEARBOX: TYPE: REDUCTION; RATIO: VARIABLE; SPEED: 2700/3100/3400/4000 RPM; POWER: 55 KW; SUPPL P/N: ET3600FS; BREVIN 3 STAGE, FLANGED MOUNT, TORQUE 5000 NM, EFFIENCY 90 PCT.
61	214615	**Refurbish** GEARBOX: TYPE: REDUCTION; RATIO: 50.15:1; SPEED: 1500/29.9 RPM; POWER: 55 KW; SUPPL P/N: FALK 425A.
62	214615	**Supply and deliver** GEARBOX: TYPE: REDUCTION; RATIO: 50.15:1; SPEED: 1500/29.9 RPM; POWER: 55 KW; SUPPL P/N: FALK 425A.
63	593151	**Refurbish** GEARBOX: TYPE: REDUCTION; RATIO: 50.15:1; SPEED: 1500/29.9 RPM; POWER: 55 KW; SUPPL P/N: FALK 425A.
64	593151	**Supply and deliver** GEARBOX: TYPE: REDUCTION; RATIO: 50.15:1; SPEED: 1500/29.9 RPM; POWER: 55 KW; SUPPL P/N: FALK 425A.
65	215424	**Refurbish** GEARBOX: TYPE: BEVEL/HELICAL; RATIO: 19.88:1; SPEED: 1475/74 RPM; POWER: 11 KW; SUPPL P/N: KD100/LH; C.A.C; DRIVE; FLENDER BRAND.
66	215424	**Supply and deliver** GEARBOX: TYPE: BEVEL/HELICAL; RATIO: 19.88:1; SPEED: 1475/74 RPM; POWER: 11 KW; SUPPL P/N: KD100/LH; C.A.C; DRIVE; FLENDER BRAND.
67	231607	**Refurbish** GEARBOX: RATIO: 21.90:1; SPEED: 68 RPM; POWER: 45 KW; APPLICATION: ASH STACKER; SUPPL P/N: K168-A-225.
68	231607	**Supply and deliver** GEARBOX: RATIO: 21.90:1; SPEED: 68 RPM; POWER: 45 KW; APPLICATION: ASH STACKER; SUPPL P/N: K168-A-225.
69	592669	**Refurbish** GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 16:1; SPEED: 1490/969 RPM; POWER: 228 KW; SHAFT SIZE: I/P 75 X O/P 155 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRF.

70	592669	**Supply and deliver** GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 16:1; SPEED: 1490/969 RPM; POWER: 228 KW; SHAFT SIZE: I/P 75 X O/P 155 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRF.
71	592670	**Refurbish** GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 12.1; SPEED: 1488/132 RPM; POWER: 49 KW; SHAFT SIZE: I/P 45 X O/P 90 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRB2; SF: 57 WITH BACKLOCK; OIL CAPACITY: 39 L..
72	592670	**Supply and deliver** GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 12.1; SPEED: 1488/132 RPM; POWER: 49 KW; SHAFT SIZE: I/P 45 X O/P 90 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRB2; SF: 57 WITH BACKLOCK; OIL CAPACITY: 39 L..
73	592671	**Refurbish** GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 12.1; SPEED: 1488/132 RPM; POWER: 58 KW; SHAFT SIZE: I/P 45 X O/P 90 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRB2; SF: 57 WITH BACKLOCK.
74	592671	**Supply and deliver** GEARBOX: TYPE: BEVEL HELICAL GEAR; RATIO: 12.1; SPEED: 1488/132 RPM; POWER: 58 KW; SHAFT SIZE: I/P 45 X O/P 90 MM; APPLICATION: CONVEYOR DRIVE; REFERENCE NO: QHRB2; SF: 57 WITH BACKLOCK.

1.2.1 Quality Control and Assurance

The following are minimum requirements for Quality Control and Quality Assurance programs:

a. The *Repairer* shall have a QA program that, as a minimum, meets the requirements of ISO 9001: 2015 or *Employer* approved QA Program. Any sub-contractors completing any portions of the Gearbox repair and reconditioning work shall meet this requirement. The *Employer* shall accept the QA program before the start of any gearbox refurbishment or repair work.

b. The Repairers shall also comply with the requirements are stated in the Eskom's "Supplier Quality Management Specification" 240-105658000 (also known as the QM 58).

c. The Employer reserves the right to audit the Repairer's Contract.

d. If new and/or replacement parts are procured, the *Repairer* has the right to inspect these parts. Technical documentation shall be made available to the *Employer* for inspection.

e. The *Employer* has the right to impose witness and hold points, even after an order has been placed. Witness and hold points can only be waived by the *Employer*'s Quality Assurance or designated representative in writing. The *Repairer* shall provide appropriate notice of an impending witness or hold point at least 48-hours prior to the event.

f. At any phase of the Works, the *Employer* or its authorized representative reserves the right to inspect gearbox and all their components. By entering into a contract with the *Employer*, the *Repairer* therefore, consents the *Employer* or its authorized representative to unlimited access to the *Repairer*'s, including Sub-*Contractor's*, premises at all reasonable times to the extent necessary to assess compliance with the provisions of this and such other documents as may apply to the refurbishment of gearbox. Such inspections shall not relieve the *Repairer* of its obligation or responsibilities under the contract.

1.2.2 Repair Process Requirements

A gearbox which is to be sent for repair or refurbishment will either be deemed to have failed or it shall have been scheduled for refurbishment by the *Employer*. There are two phases in the repair or

refurbishment process of a gearbox. The initial Phase 1, which is commonly referred to as the “collect, strip, and assess” phase, requires details necessary to develop the assessment scope of work in order to determine the repair scope of work. To conclude the repair scope of work, the repairer shall present the inspection report and the recommended repair scope to the *Employer* for review and acceptance. Once the repair scope of work is concluded, the repair process shall enter Phase 2 in which the gearbox is repaired and delivered back to Majuba site store (Stores Receiving) as per the final scope of work and delivery schedule determined in Phase 1.

Standard scope of work for any gearboxes

Scope of work on Gearbox Refurbishment		
Items	**Description**	
1	Strip gearbox completely	
2	Clean all components	
3	Engineering assessment of all components	
4	Non-destructive testing on components where applicable	
5	Quotation generation	
6	Assess and quality control new component before assembly	
7	Assemble gearbox and quality check clearances and gear contact	
8	Test run gearbox for at least 8 hours and do second quality control	

	check after assembly	
9	Finish gearbox with paint, name plates and stickers	
10	Fit low speed coupling	
11	Fit High speed coupling	
12	Quality check for dispatch	
13	**The document with reference number :**	
13.1	Scope of work:	
13.2	Complete refurbishment of gearbox including bearings, seals, gears, shafts and housing machining	
14	**The document with reference number:**	
14.1	Scope of work:	
14.2	Bearing, seal and high speed pinion change including housing machining	
15	**The document with reference number:**	
15.1	Scope of work:	
15.2	Bearing and seal change including housing machining	
16.	Gearbox commissioning as a curtsey of refurbishment of units	
17.		

1.2.3 Phase 1 Requirements

Once a gearbox has failed during service, or once a gearbox which is in a serviceable condition has been planned for refurbishment, the following activities shall be conducted in sequence:

1.2.3.1 Breakdown Report

The following requirements shall be performed by the *Employer* and are to be compiled to develop a Breakdown Report:

a. A visual inspection shall be conducted while the gearbox is *in-situ* before its removal where all abnormalities are recorded, together with photographs.

1.2.3.2 Assessment SOW

The *Employer* shall develop the scope of work for the collection, dismantling, and assessment of the Gearbox by the *Repairer* based upon investigations included in the Breakdown Report, the *Employer* shall compile an Assessment SOW.

1.2.3.3 Gearbox Collections and Shipment

Transport of gearboxes shall be in accordance with Eskom document *240-56361435 - Transport of Power Station Gearbox Standard*. The transport of Gearbox which is still in a serviceable condition shall be transported by the *Repairer* with the necessary care to prevent damage as a result of the transport.

The following are Majuba Power Station's gearbox collection and shipping requirements:

a. The gearbox collection point and lifting requirements shall be managed by the *Employer*.
b. Only authorised *Employer* personnel shall load the Gearbox to and the repairer e *Repairer's* transport.
c. The *Employer* shall supply tools and resources necessary to load gearbox and the repairer remain responsible to clamp the gearbox before transport leaves the collection point.
d. The *Employer* is responsible to inform the *Repairer* of specific Business Unit requirements, e.g. security requirements and collection times.

1.2.3.4 Gearbox Assessment

The successful *Repairer* shall implement the contracted Assessment SOW, without deviation, as specified in the following sub-sections:

1.2.3.5 Incoming Inspection

The *Repairer* shall, on receipt of the Gearbox, perform and initiate the listed in the Assessment SOW. The inspection is to determine the probable cause of the failure if any, record the findings, and to determine additional work which may be required.

The following are required:

a. A visual inspection shall be made to assess the general condition of the gearbox exterior for cracks, broken welds and missing parts. Photographs are to be taken sufficient to document the gearbox construction, including accessories.
b. If the gearbox was in a working condition all standard routine tests are to be performed on the gearbox, including the following (where applicable)
    - Balancing, backlash setting and vibrations, during a test run.
c. If failed components are identified during the incoming inspection, the *Repairer* shall reflect these findings in a report.
d. Bearings or shafts shall be checked for any obvious problems by manual rotation, if possible.
    - The *Repairer* shall ensure that the bearings are adequately lubricated before performing the manual rotation check.

1.2.3.6 Gearbox Dismantling

After completing the incoming inspection, the gearbox shall be dismantled to conduct the pre-cleaning assessment.

Gearbox shall be dismantled as follows:

a. Gearbox that involves either warranty or insurance claims shall not be disassembled without the *Employer* giving a written ‘go ahead’ for the *Repairer* to commence with the disassembling. Arrangements shall be made for interested and affected parties to witness the dismantling. The *Employer* Assessment SOW shall have a HOLD-POINT for such a requirement. The *Repairer* is required to take pictures and records throughout the disassembly.
b. All gearboxes components shall be marked with either the gearbox manufacturer’s serial number or *Repairer*’s job number during disassembly. Any new stamp identifications added

shall be applied to low stress areas with low stress punches. Old nameplates or stamp identifications of previous refurbishments on the gearbox are not to be removed. Bolts and small parts, from the gearbox shall be stored in dedicated containers marked with a *Repairer*'s job number.

c. End brackets and frames shall be clearly match-marked.
d. All components are to be properly stored thereby ensuring storage conditions do not adversely affect the components.
e. Records concerning the bearings are to be documented.
f. Additional information gathered during disassembly inspections shall be used to support the cause of failure analysis. Failure causes shall be discussed with the *Employer* before repair work proceeds.

1.2.3.7 Pre-Cleaning Assessment

Prior to the gearbox being cleaned, all components shall be inspected and tested. Due to gearbox contamination however, some components may require cleaning for a complete inspection and testing. The *Repairer* shall notify the *Employer* of any anomalies identified and shall document findings with photographs.

1.2.3.8 Failure Report

When a gearbox is received in a failed condition, all effort must be made to determine the root cause of failure. In the case of uncertainty, all possible root causes are to be listed. Root causes of the failures are to be determined during the various stages of the refurbishment process such as testing, dismantling, etc. Abnormalities that could have contributed to the failure are to be properly recorded.

The *Repairer* shall submit a report detailing findings together with photographs identifying the symptoms identified. Recommendations of corrective and preventative actions are to be provided.

1.2.3.9 Repair SOW

1.2.3.9.1 Requirements

The *Repairer shall* provide the *Employer* with a recommended repair SOW based on his own analysis of the failure and the need to fulfil the repaired gearbox performance requirements. The recommended SOW is governed by the following requirements:

a. It shall be based on the *Employer's* inspection outcome actions. Deviation from the *Employer*'s inspection outcome actions is allowed, provided that the *Repairer* technically justifies the deviation.
b. It shall be e-mailed to the *Employer* for review, influence and acceptance.

1.2.3.9.2 *Repair and Reconditioning Tasks*

As a guideline, the following repair and reconditioning tasks shall be included in the SOW:

a. All broken or rusty miscellaneous hardware such as nuts, bolts, and washers shall be replaced. New hardware shall be of a similar or better grade to that being replaced..
b. Repair any defects
c. Replace any cracked or broken bolts.
d. Missing, or defective mounting hardware shall be replaced and mounting bolts shall, or shall be locked in place by applying Loctite ® to bolt threads or by other equivalent means to prevent loosening in operation.
e. Cracks in welds are to be repaired
f. All rolling-element bearings shall be replaced. Repair bearing housing defects and restore bearing fits in accordance with best practices.
g. Defective oil rings shall be repaired, or replaced. Screws in split oil rings shall be tightened and locked in place by pining or some other means. If the oil ring viewing port glass in the bearing housing is no longer transparent, it shall be replaced.
h. Defective bearing shall be replaced

1.2.3.9.3 *Painting*

Painting shall be done in accordance with the following procedure:

a. Surface preparation shall involve the removal of all corrosion, oil, grease, dirt, and old paint with a combination of commercially accepted cleaning agents, abrasive blasting, power tool, and hand tool cleaning. Metal surfaces shall have sufficient roughness to provide proper adhesion of new paint.
b. At least one primer coat and two finishing 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.
c. The finishing colour for external metal surfaces shall be Emerald/Light Grey (G29) or other as specified.

1.2.3.10 Repaired Gearbox Delivery

All gearboxes shall be prepared for shipment and delivered as per the SOW and Eskom 240- 56361435. If the gearboxes are to be sent into storage, such shall be in accordance with Eskom 240- 56360387. The following is required:

a. Gearboxes shall be delivered to site after the *Employer*'s acceptance that the repair SOW has been satisfactorily completed. Any gearbox delivered before the *Repairer* receives confirmation of acceptance may, at the *Employer*'s discretion, be returned to the *Repairer* without any cost to the *Employer*.
b. The *Repairer* packages the Gearbox with appropriate preservatives and machined surface protection as to minimize damage during storage.
c. All spall components will be firmly censured to the Main unit as to prevent loss.
d. The *Repairer* shall arrange a gearbox delivery date, time, and location with the *Employer*.
e. All documentation regarding work performed on the gearbox shall be delivered with the gearbox. Documentation shall include reports of results for all tests performed, whether the tests are specifically required within this document or not.
f. The *Employer* reserves the right to inspect the gearbox and transport upon delivery and, if the delivery is found not to be in accordance with applicable specifications, return the gearbox the *Repairer* without any costs to the *Employer*.
g. The *Employer* shall provide necessary resources for the gearbox to be off-loaded from the *Repairer's* transport.

1.2.4 Inspection and Testing

Tests and checks shall be performed in accordance with applicable sections in the two phases of repair. If certain results are unacceptable, the *Repairer* shall notify the *Employer* to discuss viable solutions.

a. During the course of repair, the *Employer* may inspect the work at hand to ensure the methods and materials employed are satisfactory. The relevant QCP is to include agreed test criteria, hold points and inspection points.
b. On completion of work, the machine shall be inspected and tested by the *Repairer* to the satisfaction and requirements of the *Employer*. Prior to contacting the *Employer* to arrange a date for witness testing, the *Repairer* shall have satisfied the *Employer'*s requirements of a successful refurbishment/repair.
c. Appropriately qualified personnel are to be used for diagnostic testing, inspections and report compilation. The reports are to form part of the quality documentation for the repair.

1.2.4.1 Test Reports

a. Gearbox test results shall be recorded on the *Employer's* standard forms for routine tests and performance tests as specified in Eskom Standard 240-50237155. The *Repairer* may use their own standard report forms, but the forms must be amended or supplemented, as needed, to clearly and completely cover any reporting items required by the *Employer's* standard forms. Use of *Repairer* standard forms shall be approved by the *Employer*.
b. The *Repairer*'s test reports shall include the results of all tests performed, whether the tests are specifically required herein or not.

1.2.5 Mechanical Checks during Assembly

1.2.5.1 Emergency Repairs

The requirements of the normal repair procedure are applicable to emergency repairs, the difference being the duration for the requirements to be fulfilled. The *Employer* may classify the gearbox to require emergency repairs. Emergency repair work may require to be performed in situ.

Ad hoc field services shall be required if the gearbox can be repaired on site.

1.3 Interpretation and Terminology

The following abbreviations are used in this Service Information:

Abbreviation	***Meaning given to the abbreviation***
CDSS	Contractor Document Submission Schedule
COID	Occupational Injuries and Diseases
DE	Drive End

EMS	Environmental Management System
ISO	International Standard Organisation
KPIs	Key Performance Indicators
MS	Microsoft
NDE	Non-Drive End
NEC	New Engineering Contract
NEC	New Engineering Contract
O&M	Operating and Maintenance
OEM	Original Equipment Manufacturer
OHSA	Occupational Health and Safety Act
ORHVS	Operating Regulations for High Voltage System
SANS	South African National Standards
SANS	South African National Standards
SAQA	South African Qualification Authority
SOW	Scope of Work
VAT	Value Added Tax

2 Management Strategy and Start Up

2.1 The *Contractor*'s Plan for the *Service*

In the case of a breakdown that lasts longer than 5 working days the contractor shall provide a plan to correct any defects needed to get the machine running.

This plan includes:

a) Description of defect
b) Reasons for lengthy repairs
c) Date machine will be back in service

2.2 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Supply Manager* as follows:

Title and purpose	**Approximate time & interval**	**Location**	**Attendance by:**
Kick off meeting and scope clarification.	Within 1 week after start date	Majuba Power Station, Specific conference room TBA	*Services Manager*, *Contractor* and Supervisors
Risk register and compensation events	monthly	Majuba Power Station, Specific conference room TBA	*Services Manager*, *Contractor*
Safety meeting	Monthly	Majuba Power Station, Production boardroom (U4 16m level)	Safety Officer
Assessment Meetings	Monthly	Service Manager's office	Site Manager, Outage coordinator and Supervisors

a) Meetings of a specialist nature may be convened at times and locations to suit the Parties. Records of these meetings shall be submitted to the *Service Manager* by the person convening the meeting within five days of the meeting.

b) All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

2.3 *Contractor*'s Management, Supervision and Key People

2.3.1 The Key Persons

Roles and responsibilities requirements for the contractor's key people required to render the service:

Designation	**Gearbox Supervisor/Foreman**	**Technicians/ Tradespersons**
Number of	x 1	Determined by the contractor depending on the works
Special requirement	On an Ad-Hoc basis will be requested to come to site for field work	Determined by the contractor Will be works dependant
Qualifications	Experienced and Competent gearbox Technician (Fitter & Turner/Millwright) NEC 3/4	Competent gearbox technician Fitter & Turner/ Millwright
Experience	Minimum of 10 years of Related Experience**	Minimum of 3 years of Related Experience
Name:		
Tel		
Name		
Tel:		

a) Competent gearbox technician/tradesperson will for the purpose of this contract mean a person who-

a. Has completed a learnership or an apprenticeship in the trade of; fitting and turning, millwright or electrical.

b. Has completed a mechanical trade qualification and has had at least three years post qualification general practical experience on gearboxes or,

c. Has obtained a minimum of an NQF level 5 mechanical engineering qualification and has had at least three year post qualification general practical experience on gearboxes.

b) The Contractor's Site Supervisor ensures that only competent persons be allowed to work on plant. The Employer's Service Manager is entitled to verify the qualifications of the Contractor.

c) Site engineers over and above the key persons mentioned above might also be require on an ad-hoc basis.

d) The Contractor's supervisor/ Foreman must be knowledgeable about the conditions and scope of work contained in this contract and capable of executing the scope of work.

e) The Services Manager may, having stated reasons, instruct the Contractor to remove a key person. The Contractor then arranges that, after one day, the key person has no further connection with the work included in this contract.

f) The Contractor may not replace any of the key persons, without prior written request and approval thereof from the Services *Manager*.

g) The above qualifications and experience requirements are a minimum

h) The contractor must provide hourly rates for each of the above key persons in the price list.

2.4 Provision of bonds and guarantees

The form in which a bond or guarantee required by the *conditions of contract* is to be provided by the *Contractor,* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Service Manager* to receive and accept such bond or guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer*'s right to termination stated in this contract.

2.5 Site Establishment

Not Applicable

2.6 Documentation Control

Document management control will be handled as per the employer's document and records management procedure 32-6, 32-1 and 32-21 which is obtainable from the *Service Manager*. All communication will be in writing.

All NEC standard forms should be used, e.g. Task orders, Early Warnings, Defect certificates and Assessments.

2.6.1 Procedures, Records and Reports

The *Contractor* implements the following procedures or paperwork over the first month of this Contract:

a) Business Organisation Chart
b) Safety procedures

The following policies, procedures and specifications will be compiled by the contractor at all times:

a) Site Regulations – Majuba site Regulations

c) BIA/RM/STD/01 – Safety, health and environmental requirements to be met by Contractors (available on request)
d) Eskom Majuba Site transport requirements
e) Construction Regulations
f) Occupational, health and Safety Act
g) Eskom Life Serving Rules
h) BIA/QA/STD/01 – Quality requirements for engineering and construction works (available on request)
i) All Relevant Majuba Power Station standards, policies and procedures

2.6.2 Record Book – Machine Room

The Contractor will provide on-site record of all activities carried out on the equipment. This record will be permanently displayed and kept in the machine room.

2.6.3 Defect Notification

In the event of a breakdown the Contractor will follow Majuba's "Defect Notification Procedure" ENG/ELEC/WI/02 to ensure that all defects are routed through the Contractors call service.

2.6.4 Employer Communication Book

To aid effective two-way communication the Contractor will provide an on-site communication book that will be situated at the Contract's Supervisor's Possession.

Sub-contracting

Only sub-*Contractor*s authorized by the *Employer* will carry out work on the equipment in terms of this contract.

2.6.5 Possession, Control of Equipment

The *Contractor* will not assume possession or control of any part of the equipment all of which shall remain exclusively the property of the *Employer.*

2.7 Invoicing and Payment

Within one week of receiving a payment certificate from the *Service Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Service Manager*'s payment certificate.

The Contractor shall address the tax invoice to:
Accounts Payable Services
Eskom Holdings Ltd
Majuba Power Station
Private Bag X9001
Volksrust
2470

The following information will be included on each invoice:

- Name and address of the *Contractor* and the *Service Manager;*
- The contract number and title;
- Contractor's VAT registration number;
- The Employer's VAT registration number 4740101508;
- Description of service provided for each item invoiced based on the Price List;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

All invoices are to be submitted to the Majuba Accounts Payable Services Department.

Payment will be made electronically 30 days after assessment and receipt of a valid invoice. Cost Price Adjustment implementation (CPA)

If CPA is applicable, the contract manager and the contractor must confirm the increase/decrease with the QS (Quantity Survey) department BEFORE the revised prices are stated on the Invoice. The QS and Contract Manager must confirm the escalation with the Financial Department before it may be implemented.

2.7.1 Invoice price versus order price

It is important that the value stated on the Invoice must be the same as the value stated on the Order. If the Invoice value is different from the Order value payment of the invoice will be delayed. It is strongly recommended that if there are any discrepancies on the Invoice, it be rectified with the Buyer BEFORE it is submitted for payment.

2.7.2 Labour

All labour laws must be adhered to.

2.8 Records of Defined Cost

In order to substantiate the Defined Cost of compensation events, the *Employer* may require the *Contractor* to keep records of amounts paid by him for people employed by the *Contractor*, Plant and Materials, work subcontracted by the *Contractor* and Equipment. [See clause 11.2(5) and 63.2].

The *Contractors* Site Manager will complete the site daily log and this will be submitted to the *Employers Representatives* for his signature before 12am of the following morning barring weekends. The Friday and weekend logs will be submitted before 12am Mondays. The log will include but not be limited to the following:

- Date and day.
- Weather.
- Site Conditions.
- Work Done.
- Labour on site.
- Any incidents during that period.
- Any communication that took place.

2.9 Things provided at the end of the *Service Period* for the *Employer*'s use

2.9.1 Equipment

None

2.9.2 Information and other things

None

2.10 Management of work done by Task Order

A task order will be issued for tasks at hand as per descriptions from the Service Manager who will be managing this contract on the employer's behalf.

2.11 Contractor to note and comply with the following

- The Employer reserves the right to have any of the Contractor's personnel removed off site without any compensation to the Contractor in the event of the Contractor's personnel being in contravention with the OHS Act or any of the Employer's Life-saving rules, regulations and procedures.
- The Employer reserves the right to request disciplinary/corrective action if, and when, required.
- The Contractor will operate under the direction and instructions of Employer.
- The Contractor will provide all safety apparel, safety equipment and cleaning materials to comply with the construction regulation.

3 Health and safety, the environment and quality assurance

3.1 Health and Safety Risk Management

3.1.1 General

The *Contractor* must ensure that all his personnel attend a Health and Safety Induction Course prior to starting with their work. The Induction Course can, on request, be provided by the *Employer* and will be valid for the duration of the *services*.

Safety Risk Management has the right and authority to visit and inspect the *Contractor's* workplace or site establishment to ensure that tools, machinery and equipment comply with the minimum safety requirements.

The *Service Manager* shall be entitled to instruct the *Contractor* to stop work, without penalty to the *Employer*, where the *Contractor's* personnel fail to conform to safety standards or contravene health and safety regulations. The *Service Manager* is entitled to cause the *Contractor* to discipline his employees and to conduct a disciplinary action, and submit a report to *the Service Manager.* The *Contractor* shall implement additional health and safety precautions where necessary.

The *Contractor* will provide all his personnel with the required personal protective equipment.

Risk Assessments, Pre-Job Briefs, Post – Job Briefs & Job Observations will be conducted for all jobs.

All Construction Regulation - safety requirements should also be adhered to.

- Safety Plan
- Fall Protection Plan (repairing / replacing of conveying lines using scaffolding)
- 16.1 and 16.2 appointments

3.1.2 Fire Precautions

Any tampering with the *Employer*'s fire equipment is strictly forbidden.

All exit doors, fire escape routes, walkways, stairways, stair landings and access to electrical distribution boards must be kept free of obstruction and not be used for work or storage at any time. Firefighting equipment must always remain accessible.

In case of a fire, report the location and extent of the fire to the Electrical Operating Desk at extension 3803.

Take the necessary action to safeguard the area to prevent injury and spreading of the fire.

3.1.3 Reporting of Accidents/Near Misses

The *Employer* follows an accident prevention policy that includes the investigation of all accidents involving personnel and property. This is done with the intention of introducing control measures to prevent a recurrence of the same incidents. The *Contractor* is expected to fully co-operate to achieve this objective. The Service Manager must be informed immediately of any incidents and any damage to property or equipment must be reported to the Service Manager within 24 hours.

NOTE! This report does not relieve the *Contractor* of his legal obligation to report certain incidents to the Department of Labor, or to keep records in terms of the Occupational Health and Safety Act, and Compensation for Occupational Injuries and Diseases Act.

3.1.4 Barricading and screens

The *Contractor* will provide and install barricades and warning devices to ensure that equipment and persons are not exposed to danger or to prevent access to dangerous areas.

All welding, flame cutting and grinding work shall be properly screened to protect persons from any injury. All gratings shall be covered with adequate protective screening when welding or flame cutting in the vicinity.

3.1.5 Speed Limit

All vehicles must be driven with due consideration for personnel and property. A maximum speed limit of 40 kilometers per hour will be always adhered to on the premises.

3.1.6 Safety

a) The *Contractor* complies with the Occupational Health and Safety Act, 1993, (the Act) and all Safety procedures issued by the *Employer*. The *Contractor* must furthermore comply with the *Employer*'s Safety, health and Environmental requirements for *Contractor*s, BIA/RM/STD/01, which is available from the Majuba Documentation Centre.

b) The *Contractor* will carry out work according to Procedure GGR 0992 (Plant Safety Regulations). The *Contractor* will qualify his supervisors to take out permits on the *Employer*'s permit to work system in order to always have one authorised person available to take out permits per shift.

c) The *Contractor* will conform to all rules and regulations applicable to Plant Safety and shall complete a proper risk assessment and Worker's Register prior to working on the plant.

d) The *Contractor* will ensure that his representatives are duly authorised in terms of the Plant Safety Regulations as a responsible person upon commencement of work.

e) The *Employer* shall on request from the *Contractor* isolate required plant from all sources of danger as described in the Plant Safety Regulations.
f) The Employer will provide the Plant Safety Regulation training to the *Contractor*.
g) The *Employer* shall make a copy of the Plant Safety Regulations available to the Contractor.
h) The *Contractor* will attend monthly safety meetings, and conduct monthly safety meetings with staff.
i) The *Contractor* provides all personal safety equipment, including safety belts and harnesses
j) The *Contractor* will adhere to the Eskom cardinal rules.
k) The *Contractor* will not be allowed to transport any of its workers in open vehicles to and from site as prescribed in the Eskom safety policy.

3.2 Lighting

The *Contractor* shall comply with the requirements of the Occupational Health and Safety Act and ensure that adequate lighting is provided to work areas at all times.

3.3 Compressed Air

a) Compressed air at 6 bars will be available in certain areas of site subject to advice by the Employer
b) Facilities for water and compressed air are indicated with Eskom colour coding.

3.4 Supply of Electricity

Employer will make available to the Contractor 220/230-volt electrical supply free of charge from the closest existing point of supply.

The *Contractor* is to make provision for the necessary extensions and plug points.

3.5 Telephones and Telecommunications

Should the *Contractor* require a telephone service he shall make his own arrangements with the *Employer*s Representative.

3.6 Accommodation

The *Employer* will not provide any accommodation for the *Contractor*

3.7 Welding on site

No welding will be allowed on site unless permission is granted in writing by the *Employers Representative*.

3.8 Environmental constraints and management

The *Contractor* should adhere to the Majuba Power Station Environmental Management System that must meet the requirements of ISO 14001:2004.

The EMS requirements are detailed in the latest revision of the following documents, which are available from the Majuba Power Station Documentation Centre or Internal Web site, and include:

a) Environmental Management Policy **BIA/ENV/04**
b) Environmental Management System Manual **BIA/ENV/03**
c) Waste Management at Majuba **BIA/ENV/01**
d) Oil Spill Management at Majuba **BIA/ENV/02**
e) Environmental Legal Register (List of Environmental Legislation applicable to Majuba) **ENG/ENV/01**

The *Contractor* will be responsible for complying with any new environmental requirements, relevant to the Works Information that may come into effect as part of Majuba Power Station's EMS for the duration of this contract.

If there is uncertainty around any environmental issues, the Environmental Department at Majuba Power Station may be contacted.

All work complies with the relevant environmental regulations. The works may include the use of some toxic or hazardous substances during normal and routine maintenance activities. In this case the *Contractor* uses such hazardous substances in accordance with the applicable regulations and procedures and is disposed of by the *Contractor* in accordance with the applicable law.

3.9 Quality assurance requirements

3.9.1 Quality Requirements

The Contractor guarantees to utilize the OEM approved parts, components and lubricants.

The *Employer* may, by arrangement, inspect completed work. If, in opinion of the *Employer*, the work does not comply with the quality requirements expected from the *Contractor*, the *Employer* shall instruct the *Contractor* to rectify the faults. The *Contractor* will comply with the instructions.

The Contractor will comply with the Employer's Quality Requirements as specified in procedure BIA/QA/STD/01 latest revision, which is available from the Documentation Centre or the internal Majuba Web site.

All Quality Control documentation must be submitted to the Employer's Representative for acceptance prior to any work commencing.

3.9.2 Contractor Document Submission Schedule (CDSS)

Refer to section named “Low service damages” below.

4 Procurement

4.1 People

4.1.1 Minimum requirements of people employed

a) All Semi-skilled personnel are in possession of valid school senior certificate.
b) All Artisans are both qualified and in possession of a valid trade test certificate or in possession of a competency certificate. 2 years minimum experience required.
c) All Supervisors are qualified and in possession of a valid diploma and must have undergone supervisory training from a reputable institution. 2 years minimum experience required.
d) All project managers, site managers and project leaders must have undergone training in contracts management (e.g. NEC3), any technical discipline (e.g. construction, civil, mechanical, electrical, C&I), and managerial course (e.g. project management, etc.) from reputable institutions. 2 years minimum experience required.
e) The Contractor will provide trained personnel for the implementation of all work.
f) The Contractor remunerates his employees at not less than the proclaimed statutory wage (Minimum Wages Act). Failure in this regard will result in non-performance and therefore immediate termination of the contract.

In order to fully evaluate a tender, the Contractor is to submit an organogram, which is to include the relevant skills levels.

According to the SKILLS DEVELOPMENT ACT 97 OF 1998, the following definition for artisans and trades are emphasised:

- **Artisan** means a person that has been certified as competent to perform a listed trade in accordance with this Act. (Definition of “artisan” inserted by section 1(a) of Act 37 of 2008)
- **Trade** means an occupation for which an artisan qualification is required in terms of section 26B. (section 1(i) of Act 37 of 2008)

Section 26C section 2 (a) states the following – “No person, whether employed or self-employed, may hold themselves out to be qualified as an artisan in a listed trade unless that person is registered as an artisan in terms of subsection (1)”

With reference to the Act, all personnel are adequately qualified for the task to be performed.

Qualifications of all staff to be submitted to the Service Manger two weeks prior to commencement of work and approval of qualifications of staff to be granted within one week of receipt of qualifications.

The Contractor submits requests to change any pre-approved staff together with proof of qualifications for approval prior to changing the staff.

4.1.2 Skills table

The following table contains the minimum Skills required.

Note: this is an as and when required contract; The Quantity of the skills required is determined by the *Contractor* per task order based on the identified scope once the failure inspection is complete.

, Skill,	Qty	Minimum Qualification	Training	Related Experience
manager	1	National Diploma	contracts management NEC3 Project Management	2 years
Quality Controller	1	Trade test certificate	ISO 9001:2015	5 years
Supervisor	1	Mechanical National Diploma		2 years
Artisans	As Required	trade test certificate Fitter, Turner, Machinist Millwright		2 years
Semi-skilled	As Required	school senior certificate		

4.2 Plant and Materials

4.2.1 Specifications

None

4.2.2 Correction of defects

None

5 Working on the Affected Property

5.1 Employer’s site entry and security control, permits, and site regulations

The entry to site is only approved once the following are adhered to:

a) The Contractor's safety file is approved by the Employer's Safety department.
b) All personnel have undergone screening for criminal records and outstanding arrest warrants.
c) All personnel have attended site-specific safety induction training.
d) Complied with the requirements as stated in the General Works information.

5.2 Callouts - Overtime

a) The Contractor shall provide a callout service to respond to any stoppage or malfunction of the equipment at any time after the Contractor’s working hours, providing a 24-hour standby service, with a response time of within (2 - 3) hours for emergencies (occupied).
b) Callout service shall consist of emergency adjustments to restore an inoperative or faulty unit to safe and satisfactory condition.
c) In the case of any major breakdown, a repair plan of action must be submitted to the Employer within the next working day.

d) Repair work to commence on the exact time agreed between the Employer and the Contractor on this plan of action. No additional cost to the Employer for this service will be acceptable if during normal working hours.

5.3 Health and Safety Facilities on the Affected Property

Refer to the General Works information.

Contractor is required to undergo departmental safety induction programme for every department where service will be rendered.

5.4 Site Services and Facilities

5.4.1 Provided by the *Employer*

a) Access to all affected areas
b) Sanitation (drinking water and toilets).
c) Medical Centre (The Employer will recover all costs)
d) Electricity connection/disconnection: The *Contractor* to provide all necessary cabling, Certificate of Compliance (COC) etc. Electricity will be made available for construction purposes free of charge from power points, which will be indicated by the *Employers Representative*. The *Contractor* will be made responsible for the provision of the reticulation system from the point of supply. Both 220 (AC) Volt and 380 Volt (AC) are available on request. The *Contractor's* requirements are to be stated in his tender. Eskom does not guarantee the quality of supply of the power and the *Contractor* shall make his own arrangements for alternative supplies where required. Any breakdown or reduction in the power supply will not be grounds for claims for additional time or compensation.
e) Water connection/disconnection: Water will be made available on request free of charge from water points on site, where available. The *Contractor* will supply at his own cost all the necessary connections, fittings, piping etc. for this facility. Eskom does not guarantee continuity of supply and quality of the water and the *Contractor* shall make his own arrangements for alternative supplies where required. Any breakdown or reduction in the water supply will not be grounds for claims for additional time or compensation. Should the *Contractor* have any particular requirements with respect to water quality or supply, these requirements must be stated in his/her tender.
f) Compressed Air/Service Air, where available
g) The *Contractor* provides everything else necessary for providing the service.

5.4.2 Provided by the *Contractor*

Contractor shall provide everything else necessary for providing the Service.

a) Tools, equipment and consumables else necessary for providing the required service/s.
b) Accommodation offsite
c) Transport
d) Meals: The *Contractor* or any of his employees or subcontractors may purchase take-away meals from the fast-food outlet onsite, if available.
e) Telecommunications.
f) Everything else is necessary for providing the required service/s.

5.4.3 Low Service Damages

No.	Description	*Employer*'s Requirement	Damages payable by *Contractor*
1	Approval of safety plan	Approval ASAP after contract award or **within 1 (one) week** of contract start date. Safety plan must contain all current and relevant information and needs to be reapproved when documents change or at least on each contract anniversary.	**R500.00 per day** without an approved safety file.
2	Approval of Quality Management System (Quality File)	**Within 2 (two) weeks** of contract start date.	**R500.00 per day** without an approved quality management system in place.
3	Contract (NCR) given 3 times in 6 weeks	*Contractor* to deliver the service as per the contract scope	**R1,000.00 occurrence**
4	Late delivery of goods.	Deviation from the stipulated lead delivery time.	**R500 per day after two weeks of not delivered**
5			

6 Specifications

7 List of drawings

7.1 Drawings issued by the *Employer*

All relevant drawings are available on request from the Majuba Document Centre.