Eskom	SCOPE OF WORK	Engineering

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Date: 12/06/2024	**Date:** 12/06/2024	**Date:** 12/06/2024	**Date:** 12/06/2024

Content

1. Objectives

- The objective of this contract scope of work is source out a competent and capable service provider for the maintenance and refurbishment of all electro-hydraulic actuators and cylinders, scoop tank and radiators and the hydraulic power pack system for Coal Handling Plant at Kendal Power Station.
- The service is to ensure that all coal handling plant electro-hydraulic actuators and cylinders, scoop tank and radiators and the hydraulic power pack system are reliable, available and efficient on the plant.
- In order to ensure quality of services rendered, it is also a requirement that the relevant service provider to have the necessary workshop where repairs and testing of the components will be done when required
- The service provider must increase availability and reliability of the plant, minimise breakdowns and assure that technical support is available during breakdowns.

2. Detailed Scope of Work

2.1 Description of work execution

- Maintenance and servicing of electro-hydraulic actuators on coal handling plant with the following specification
- Maintenance and servicing of all lifting and lowering cylinders
- Maintenance and servicing of all scoop tanks and radiator for the scoop couplings
- Maintenance and servicing of all the dewatering system for the S5A&B conveyor belts
- Maintenance and servicing of all hydraulic power packs for the T4A-F conveyor system and both stacker reclaimer 1&2
- Maintenance and servicing of all luffing cylinders for the stacker reclaimers

ACTUATORS	Quantity
MOVABLE HEAD ACTUATOR – DEJ325/2G • Stroke - 3000mm • Thrust extend - 50kN; thrust retract-50kN. • Speed extend - 80mm/s; speed retract- 90mm/s • Hydraulic circuit no. double acting-regenerative piston rod locked in position when motor not running. • Operations per hr -10max • Motor - 1.1kw-380volt-4pole-IP55 • Mounting - central trunnion • Attitude - horizontal • Clevis type - ‘a’ universal • Operating temp - ambient -5`c-+40`c • Hydraulic fluid - hydraulic oil VG32	02
TRIPPLE DIVERTER GATE-ZBG245/1200 • Stroke-1200mm • Thrust extend-17.2kN; thrust retract-19.6kn • Speed extend- 20mm/s; speed retract- 40mm/s • Hydraulic circuit no. double acting piston rod locked in position when motor not running. • Operations per hour - 10max • Motor- 1.5kw-380volt - 4pole-IP55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil VG32	06

DOUBLE DIVERTER GATE-ZBG245/600 • Stroke - 600mm • Thrust extend - 25kN; thrust retract -13.5kN • Speed extend - 20mm/s; speed retract - 40mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.5kw-380volt-4pole-ip55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil vg32	06
FLOW DIVIDER ACTUATOR-ZBG193/1200 • Stroke-1200mm • Thrust extend-25kN; thrust retract-13.5kN • Speed extend- 20mm/s; speed retract- 40mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.5kW - 380volt-4pole-ip55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c, Hydraulic fluid -hydraulic oil VG32	06
T4 ACTUATORS ZBG193/700 • Stroke-700mm • Thrust extend-10kN; thrust retract-6.5kN • Speed extend- 65mm/s; speed retract- 105mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.1kw-380volt-4pole-ip55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil VG32	03

LONG AND SHORT CROSS ZBG193/600 • Stroke-600mm • Thrust extend-10kN; thrust retract-6.5kN • Speed extend- 65mm/s; speed retract- 105mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.1kw-380volt-4pole-IP55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil VG32	12
DOUBLE DIVERTER GATE-ZBG245/600 • Stroke-600mm • Thrust extend-25kN; thrust retract-13.5kN • Speed extend- 20mm/s; speed retract- 40mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.5kw-380volt-4pole-IP55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil VG32	06
FLOW DIVIDER ACTUATOR-ZBG193/1200 • Stroke-1200mm • Thrust extend-25kN; thrust retract-13.5kN • Speed extend- 20mm/s; speed retract- 40mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.5kw-380volt-4pole-IP55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil VG32	03

ZBG193/700 • Stroke-700mm • Thrust extend-10kN; thrust retract-6.5kN • Speed extend- 65mm/s; speed retract- 105mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.1kw-380volt-4pole-IP55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil VG2	03
ZBG193/600 • Stroke-600 • Thrust extend-10kN; thrust retract-6.5kN • Speed extend- 65mm/s; speed retract- 105mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.1kw-380volt-4pole-IP55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal • Operating temp-ambient -5`c-+40`c • Hydraulic fluid -hydraulic oil VG32	06
ZBG193/1000 • Stroke-1000 • Thrust extend-12kN; thrust retract-7.5kN • Speed extend- 65mm/s; speed retract- 105mm/s • Hydraulic circuit no-double acting piston rod locked in position when motor not running. • Operations per hour-10max • Motor- 1.1kw-380volt-4pole-IP55 • Mounting -central trunnion • Attitude- horizontal • Clevis type- ‘a’ universal	06

STACKER RECLAIMER HYDRAULIC LUFFING POWER PACKS	**Quantities**
Oil tanks (800Litres)	02
Hydraulic oil pumps (A10VSO018DRF)	04
Oil coolers (60Litre air blast coolers)	04
Luffing solenoid valve stack DCV, PRVs, flow control. PTO check valves	04
Boom luffing cylinders CD320/220X1200 SB/SB	04
Central chute cylinder CD40/25X80SB/SB	02
BUCKET WHEEL AND CABIN HYDRAULIC POWER PACK	
Oil tanks (120Litres)	03
Double gear pump 1PF2G240/005LN2OMDL	03
Solenoid valve stacks PRVs, flow control. PTO check valves	
Under cabin cylinder CD80/65X200 STR	03
Bucket wheel cylinder.CD80/50X100 STR	03
Capacity Probe cylinder CD45/25X400 STR	03
Hydraulic hoses and pipes (Steel pipes and flexible hoses)	100
T4 A-F UNDERBIN CONVEYOR LIFTING& LOWERING HYDRAULIC POWER PACKS	
Oil tanks (140Litres)	04
Solenoid valve stacks PRVs, flow control. PTO check valves, load holding blocks	06
T4 A-F lifting and lowering assembly cylinders CD45/25X400 STR	06
DEWATERING HYDRAULIC POWER PACK	
Oil tanks (140Litres)	03
Hand lever valve bank ¾ Inch/250bars	04
Tie rod end cylinders CD50/25X600STR	08
SCOOP TANKS	
Scoop tank.(420litre tank)	10
Hydraulic oil coolers	10
45L/minute air blast	10
Cooler electric motor	10
380v/1.2KW/1450rpm	10
Oil seals and gaskets	20
Filters and breathers	20
Hoses, pipes, and fittings	200

2.2 Responsibilities of the contractor

- Inspection and Preventative Maintenance activities shall be carried out by the contractor on a weekly using own approved check sheets
- All corrective maintenance on electro hydraulic actuators, hydraulic cylinders, power pack system, scoop tanks and radiators to be conducted the contractor
- Contractor to available when required during breakdowns of the machine, response time to be not more than 2 hours
- Contractor to offer required technical support when required
- Contractor to submit a compulsory monthly technical inspection report with finding during inspection conducted
- Inspection reports must include recommendations that should be executed on site to ensure reliability and availability of the systems.
- Contractor to conduct major overhaul of the system during outages
- Contactor to strip and remove all damaged hoses and pipes during inspection and replace them
- Contractor to provide own working tools and transport
- Contractor shall be responsible to clean prior on the area where work will be conducted

2.3 Weekly Inspections:

- Contractor shall Inspect and repair all oil leaks on hydraulic piping and fittings
- Contractor shall check oil level on all scoop tank and power packs and top up if required, note that contractor to provide own filling pump
- Inspect condition of all breather on scoop tanks and power packs and replacing dirty or blocked filters
- Contractor to clean the cooling system of the scoop tanks
- Replacement and installation of any component related to the power pack system when required
- Note that in the event where riggers are required, contractor shall supply

2.4 Emergencies and Breakdowns

- On all emergency breakdown, the contractor shall be informed accordingly by Kendal Power Station representative
- Contractor shall be responsible for collection system from site to their facility for repairs
- Contractor shall strip and assess damages to systems
- Contractor to compile detail technical report of findings and submit the report to relevant plant system engineer
- Contractor to compile scope of repairs and list all component to be replaced
- Contractor to submit detail repair quotation to contracts manager
- It is the responsibility of the contractor to ensure that the turnaround time for repairing the items is the shortest period possible and returned to site in working condition
- All quality control processes to be followed by the contractor at their facility
- Frequent feedback between Kendal Power Station and the contractor is essential during breakdowns.
- Upon completion on repairs, the contractor shall return the unit to site for installation

2.5 The following tasks to be done on the power packs and hydraulic tanks during major overhaul

- Remove and replace all sealing gaskets.
- Replace O-rings
- Replace fittings sealing washers.
- Strip the cooler electric motor from the system.
- Check motor windings is they are all clear and balanced, if not rewind the electric motor.
- Replace defective motor drive and non-drive end bearings.
- Secure motor connection points
- Paint the electric motor.
- Remove cooler radiators.
- Flush cooler radiators to unblock the fins for free air ways.
- Pressure tests the cooler to 2.5bars and check for any leaks.
- Cooler oil ports should be always plugged during the flushing and cleaning process to avoid foreign particles
- Contractor to sandblast hydraulic tank to remove all the rust.
- Contractor to recondition and paint the tank.
- Install new site glass.
- Strip and assess valve stack on power packs
- Service load holding blocks on power packs
- Service valve stack PRVs, replace seals and O-rings on power packs
- Service flow control valves power packs
- Service stack check valves on power packs
- Set flow control valves and PRVs on power packs
- Assemble the hydraulic scoop tank with new and serviced components i.e., serviced, and sandblasted tank, serviced hydraulic cooler, new tanks site glass, new filters, new clogging indicators, new pipes and fittings, new seals.
- Replace all pipes with new as per their sizes and pressure ratings.
- Install all new seals and O-rings on valves, fittings and sub-plate mountings.
- Fill the tank with new VG68 hydraulic oil for pressure testing.
- Connect electric motor to the coolers.
- Secure all valves mountings, electric motor, and tank frame.
- Secure all mounting bolts.
- Tighten fittings, pipes, and hoses to avoid leaks.
- Conduct function test

2.6 Contractor to conduct the following tasks during overhaul of the cylinders and actuators

- Strip and assess hydraulic cylinders
- Change seals, wear rings and wipers
- Check barrel tolerances and recondition if out
- Check piston rods for score and scratch marks
- Recondition glands pistons and pushes
- Replace clevis bearings
- Assemble and test cylinder
- Pressure test and factory acceptance test

2.7 Quality control and house keeping

- Assure that an approved QCP is in place prior work execution when repairing items off-site
- Assure all debris are cleared from the plant after conducting work
- Scrap metal to be place on designated area
- On areas where scaffolding was erected, it must be completely removed
- Re-commission the plant upon installation of the equipment
- Contractors is responsible to transport damaged spares to the workshop
- Contractor responsible to collect and transport required spares from the workshop

2.7.1 Critical and Normal spares

- The contractor shall keep critical spares for assembly on their shelve in order to eliminate downtime resulting from long lead items

3. Acceptance

This document has been seen and accepted by:

Name	Designation
Malusi Kekana	Coal Plant Supervisor
Phindile Magongwa	Coal Plant Maintenance Manager
Sazi Jele	Coal Plant Senior Engineer
Dwight Reed	Snr Technician Coal
Thando Gxota	Aux Engineering Manager

4. Revisions

Date	Rev.	Compiler	Remarks
June 2024	00	S Malgas	SOW