Eskom	**Signed-off Scope Of Work**	
TITLE: SOOTBLOWER CONTRACT TO DO INSPECTIONS, MAINTENANCE AND REPAIRS DURING NORMAL MAINTENANCE AND OUTAGES AT TUTUKA POWER STATION FOR A PERIOD OF 5 YEARS		**Document type:** Signed-off scope of work
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1. PURPOSE

To propose and approve a contract strategy for sootblower maintenance contract at Tutuka power station

In order to ensure sustained performance of plant and equipment on a long –term basis, this service has been structured in line with reliability cantered maintenance and outage philosophy and also incorporating a preventative strategy on the Sootblowing plant. This is also in support of reducing sootblower induced / related boiler the failures (BTF) over the short and long term. It is further also focussing on improvement to support the boiler tube failure reduction (BTFR) team goals for the business in terms of improving both boiler and availability and reliability

This philosophy applies to the Sootblowing Plant consisting of all the steam supply piping, sootblowers and drain piping for Boilers 1-6. A clear distinction should be made regarding the different the different types of outages and related scope of work (SOW) for these outages types.

2. SCOPE OF WORK

2.1 Executive overview

In order to ensure sustained performance of plant and equipment on a long-term basis, this services have been structured in line with a reliability cantered maintenance and outage philosophy and also incorporating a preventive strategy on the sootblowing plant. This is also in support of reducing soot blower induced / related boiler tube failures (BTF) over the short and long term It is further also focussing on improvements to support the boiler tube failure reduction (BTFR) team goals for the business in terms of improving both boiler availability and reliability.

This philosophy applies to the Soot Blowing Plant consisting of all the steam supply piping, soot blowers and drain piping for Boilers 1-6. A clear distinction should be made regarding the different types of outages and the related scope of work (SOW) for these outage types.

2.2 The Scope of Work entails Sootblower inspection, maintenance and repairs on U1-U6 at Tutuka Power Station.

Work to be performed by *Contractor*

- To perform general inspections, mechanical and electrical maintenance and cleaning of the soot-blower system on a daily basis
- Maintenance of all lance and wall blowers as per scope of work.
- To perform monthly inspections on Unit 1 to 6 as per *Employer's* Planned Maintenance system and PM must be completed timeously
- The *Contractor* must return the completed defects to the *Service Manager* for final processing
- The *Contractor* must carry out all corrective maintenance of defects, generated from the inspection of the PM This must be carried out within (2) two days of such inspection
- *Contractor* Supervisor required to do supervision on own employees at all times
- Inspect all soot blowers during the soot blowing sequence
- Maintenance of the Sootblower Station on 81m lvl-this includes the Control valves and replacement of gaskets, excluding the PRV

- *Contractor* to be responsible for replacing drain valve orifices and draining the drain valve pockets as per required scope
- *Contractor* should be capable to utilise own riggers for replacement of lance blowers
- The *Contractor* shall be responsible for the maintenance all electrical components/equipment on the blowers.
- Only qualified Electricians with a trade test certificate shall be permitted to work on electrical equipment
- The *Contractor* shall perform planned maintenance for units on load and on planned outage work on the sootblower system, and shall also attend to any emergent or unplanned plant defects as required by Employer.
- The *Contractor* shall perform any required fault finding and resolve the plant defects.
- It is the *Contractor*'s responsibility to ensure that all spares are available to execute the required maintenance, where a risk arises, the *Contractor* informs the *Employer* of such risk to spares timeously.
- The *Contractor* shall, on a monthly basis, submit a report of the works performed, defects corrected and any plant abnormalities which need to be addressed. These abnormalities shall include, insufficient lighting in the vicinity of the sootblower system, any electrical panels which are damaged, damaged cabling which pose a risk of fire or which may lead to failure of the system, any potential risks from the sootblower system or systems adjacent the sootblower system which may affect the sootblower system, a list of spares including stores holding and spares used in that particular month, and any other plant defect which may require Engineering assessment and possible modification.

All scopes mentioned are relevant normal online maintenance, opportunity outages and major outages, pending duration and spares.

Scope for Lance Blowers

Inspect all lance blowers during sootblower sequence
Gearbox:

- Remove and replace stuck outer and inner lances
- Clean the gearbox (incl. motor pinion)
- Inspect guide rollers and replace if necessary
- Replace support rollers
- Renew stainless steel seals
- Renew oil seal on drive shafts
- Renew grease on lance hub
- Replace sight glasses when necessary
- Straighten/replace striking pin when necessary
- Replace bearing when necessary
- Replace undercarriage striking-pin

Poppet valve:

- Clean the valves
- Repack glands
- Lubricate yoke assembly
- Set stroke indicators
- Adjust linkages to ensure correct operation

- Check pin plug and shorten plug
- Replace copper joint
- Replace metaflex joint
- Replace valve when scoped to do so

Air Relief valve:

- Remove strip and clean the valve
- Lap seat on relief valve
- Replace ball in valve
- Reassemble and replace valve on correct position
- Remove and replace pressure gauges

Beam and attachments:

- Repair gear rack
- Repair front support brackets and rollers
- Lubricate all connections
- Repair wall seal gaps
- Repair wall sleeve
- Replace under carriage rollers
- Repair linking mechanism on auxiliary support
- Tighten auxiliary support and holding beams
- Regular cleaning of the centre carriage

Lance and feed tube

- *Check size and condition of lance nozzles*
- Renew feed tube-sealing face
- Replace bolts and studs on outer lances
- Replace outer lance nut
- Replace lances as and when required

Gland assembly

- Repack glands
- Inspect and replace gland followers for cracks, souring and bush
- Limit Switches
- Check limits electrically
- *Check limit arms*
- Replace limit switch if needed
- Check limit switches secure to installation if not repair

Expanda cable

- Check for physical damages (cone assembly & expanda cable including end connections)
- Test expanda cable to ensure electrically in order
- Secure cone assembly on stainless steel rod

- All cone assemblies to be cleaned internally by removing rod
- Check to ensure that all saddles supporting the expanda cable are in place and in order
- Replace expanda cable as well as cone assembly if necessary

Electrical control box

- Clean control box
- Inspect control box
- Repair control box
- Procure and replacement of faulty Isolators.
- Ensure that the control boxes are kept clean and tidy at all times, all wiring and components to be in an orderly manner.
- Ensure proper house-keeping at all times.
- Ensure that control boxes are always closed to prevent dust ingress.

Electric motor

- Clean electrical motor
- Motor bearings identified to be faulty to be replaced
- Motor fan and fan covers to be inspected and repaired or replaced
- Check and repair loose cables and cable glands (motor & electrical box)
- *Check and replace limit wheel if necessary*
- Motor terminal box sound and secure to motor
- Check motor plug in order
- Secure motor to gearbox
- Test motor electrically to be in order
- Walk the plant and inspect motors for any dust build up, oil contamination, possible water *ingress or any other damage, and correct before the motors fail*

Limit switches

- Check limits electrically
- Check limit gear wheel
- *Set valve limits on all sootblower system.*

Scope for Gun Blowers

- Inspect all gun blowers during the soot blowing sequence

Gear reducer

- Remove cover and clean old grease
- Renew grease with specified lubrication
- Replace gearbox and gearbox shearing pin
- Replace pinion shearing pin
- Replace timing shaft assembly
- Replace oil
- Replace covers

- Replace bearing

Poppet valves

- Replace gland
- Lubricate yoke assembly
- Set stroke indicator
- Adjust valve linkages for correct operation
- Replace valve when scoped to do so

Screw tubes and nozzles

- Repair screw tubes
- Renew drive pins
- Repack glands
- Ensure nozzle point parallel to boiler tubes when poppet valves are open
- Repair guide bar assembly
- Repair poppet valve trigger
- Replace nozzle sleeves

Air relief valve

- Remove, strip and repair valve
- Lap seats
- Renew balls
- Reassemble and replace valves

Wall seals

- Inspect wall seals internal to boiler
- Replace wall seals if necessary

Electric motor

- Clean electrical motor
- Motor bearings identified to be faulty to be replaced
- Motor fan and fan covers to be inspected and repaired or replaced
- Check and repair loose cables and cable glands (motor & electrical box)
- Check and replace limit wheel if necessary
- Motor terminal box sound and secure to motor
- Check motor plug in order
- Secure motor to gearbox
- Test motor electrically to be in order

Limit switches

- Check limits electrically

- Check limit gear wheel
- Replace limit if needed
- Check limit switches secure to installation if not repair

Cold/hot commissioning – dry and wet runs to be done when work is complete after outages
Test report on the work carried out during outages to be handed to the Service Engineer and the Contract Supervisor

Poppet valves to be set as follows:

- Lances 133-40· 8 bar (7 min, 9 max)
- Lances 126-132 – 10 bar (9mm, 11 Max)
- Lances 101 – 124· – 14 bar (13 min, 15 max)
- Gun blowers 10 bar (9 min, 11 max)

Additional Scope and Outage Works Information

- Provide assistance with retracting lances when OPS is unable to do so
- Assist with the adjustment and execution of scope on the SH and RH control valves located at 81 m level
- Remove and repack all gland assemblies on Gun and Lance Blowers
- Replacing drain valve orifices and draining the drain valve pockets as per required scope

Special Request

- *Contractor* to provide demonstrable evidence that the business has the full intellectual property support of the OEM

2.3 Employer's requirements for the *service*

- All services to be done according to the *Employer's* procedures and plant safety regulations.
- All spares removed and returned to the *Employer's* premises must be declared at the main entrance where the removal permit for the spares must be shown to the protective services personnel
- PSR training will be financial covered by the *Employer* for the first training session only, thereafter it will be on *Contractor's* cost should *Contractor's* employees fail.
- All *Contractor* artisans must be authorised as Responsible Persons (RP's) as per legislative requirements and the period within which this requirement must be fully met will be finalised and confirmed within six months on contract award
- All *Contractor* supervisory staff (Supervisors) must be authorised as Authorised Supervisors (AS's) as per legislative requirements and the period within which this requirement must be fully met, will be finalised and confirmed within six month of contract award.
- The *Contractor* must clean and remove all debris after completion of the work
- The *Contractor* must complete all required inspection cards and corrective work orders
- The *Contractor* is to be at the specific working area location as defined in the Task Order or by the Contract Supervisor

- If the need arises to move away from the working area for any reason other than safety it must be under the instruction of the Contract Supervisor
- *Site access shall be granted by Eskom Holdings Tutuka Power Station protective services as* request by the *Service Manager*
- No employees will be transported on an open vehicle The vehicles must comply with Eskom minimum requirements.
- Daily time sheets will be handed-in weekly to the Contract Supervisor and approved by both the Supervisor and the *Contractor*
- *Working hours is Eskom working hours and overtime might be required depending on the workload.*
- A request for the absence from the work place must be negotiated with *Employer*
- In periods of absence a negotiated substitute (with the same skill and qualification) must maintain the plant
- Eskom Life Saving Rules to be adhered to.
- *Contractor* to transport its own employees on site for the work purpose.
- *Contractor* to provide its own radios.
- All PPE to be provided by *Contractor* at own costs, should be for all weather types and must be SABS approved and should meet Eskom standards
  All necessary and relevant PPE must be used at all time when entering or working in the plant

3. MAN-POWER PLAN

The *Contractor* will have permanent team of

The team for Maintenance consists of;

- 1 x Supervisors
- 1 x Electricians
- 1 x Semi-skilled (Electrical)
- 4 x Mechanical fitter
- 4x Semi-skilled (Mechanical)

As and when required basis during Outages, none of the core crew personnel will be included on this team

- 1 x Supervisor
- 2 x Electrician
- 2 x Semi-skilled (Electrical)
- 6 x Mechanical fitter
- 6 x Semi-skilled (Mechanical)
- 1 x Mechnician (C&I)
- 1 x Semi-skilled (C&I)
- 1 x Safety Officer