| Eskom | Instruction | Hendrina Power Station |
|---|---|---|

Title: **Scope of Work for Refurbishment of PF Burners Units 1-10**

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# TABLES

# 1 INTRODUCTION

This document defines the contract works to be executed by the successful bidder, of which is evaluated and selected using the open tender process. The Scope of Work (SOW) for this contract entails the repair and refurbishment requirements of PF burner plant at Hendrina Power Station.

# 2 SUPPORTING CLAUSES

## 2.1 SCOPE

The scope comprises of, but is not limited to, the repair and refurbishment, and transportation of all required components of the PF Burners.

### 2.1.1 Purpose

The purpose of this scope of work is to outline all the contract work to be performed by the contractor, and the responsibilities of all parties involved. The contract scope of work serves to support the tender technical evaluation process.

### 2.1.2 Applicability

This document is applicable to Hendrina Power Station.

## 2.2 NORMATIVE/INFORMATIVE REFERENCES

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

### 2.2.1 Normative

[1] 240-168966153: Generation Tender Technical Evaluation Procedure

[2] HSTTPMM060 Tender Technical Evaluation Strategy for Refurbishment, Supply and Delivery of Pump Spares

[3] QM-58 Supplier Contract Quality Requirements Specifications

[4] 240-105691858: Materials Management Safe Work Procedures Transportation Requirements for Material Handling

### 2.2.2 Informative

[5] ISO 9001 Quality Management Systems

[6] 32-1-34 Eskom Procurement Policy

## 2.3 DEFINITIONS

| Term | Definition |
|---|---|
| Contractor | Service provider contracted for supplying a specific service to Eskom Hendrina Power Station. Used interchangeably with the term *Supplier.* |
| Employer | The organization (Eskom) to which the supplier will be contracted for this tender and contracts that may result therefrom |
| Employer's Premises | Hendrina Power Station |
| Industrial Storage Facility | Physical space suitable for the storage of the items specified in the scope of work |

| Term | Definition |
|---|---|
| Returnable | Document submitted by tenderer for evaluation in support of tender bid |
| Spares | Parts that can be used for replacement, including the whole pump as a unit. |

### 2.3.1 Classification

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

## 2.4 ABBREVIATIONS

| Abbreviation | Description |
|---|---|
| FPT | Female Pipe Thread |
| kPa | Kilopascal |
| m | Metre |
| mm | Millimetre |
| MPa | Megapascal |
| MPT | Male Pipe Thread |
| OD | Outer Diameter |
| OEM | Original Equipment Manufacturer |
| IN | Inch |
| QCP/QIP | Quality Control Plan / Quality Inspection Plan |
| PS | Power Station |
| PTW | Permit to Work |
| SOW | Scope of Work |

## 2.5 ROLES AND RESPONSIBILITIES

### 2.5.1 The Employer

The responsibilities of the employer include the following:

a) Inform the contractor when PF burners need to be attended to.

b) Provide information of operations prior to refurbishment, repair, or overhaul.

c) Make all necessary arrangements, including permit to work (PTW), for the contractor to gain site access and perform work required.

d) Send a representative to the contractor's premises/workshop if there are any inspection, witness, or hold points.

### 2.5.2 Contractor

The responsibilities of the contractor include the following:

a) Comply with the employer's environmental, health, and safety standards, policies, and procedures.

b) Make all repair/refurbishment information available to the employer on request.

c) Inform the employer's representative at least 48 hours prior to any hold points that may require the employer.

### 2.6 PROCESS FOR MONITORING

N/A

### 2.7 RELATED/SUPPORTING DOCUMENTS

N/A

## 3 SCOPE OF WORK

The contractor's scope of work includes repairs and refurbishment of the PF Burners, as well as, but not limited to, the following:

### 3.1 UNITS 1-5 PF BURNERS

#### 3.1.1 Loosening of the bolts and taking out the burner(s)

• Rigging of the PF burner assembly and/or chassis assembly and safely place them on the floor grating as well as at times moving such components to the repair workshop when required.

• Disconnect bolts and nuts from the burner chassis and remove burner end covers plates for welding repairs.

• Disconnect or cut the worn front end tube of the PA tube section assembly and safely rig them to floor.

• Perform the necessary repairs by prepping the remaining section of the PA tube and the new formed front end section of the tube.

• Align the two components peripherally and perform the tack welds such that a weld assembly is formed and finally complete the seal weld accordingly. The PA tube assembly will then be completed.

• Perform any repairs arising from wear damages on any section of the PA tube that may require hot work repairs.

• The weld repairs shall apply to all PF burner components with significant wear damages or any damages on conduits that could potentially compromise the integrity of the plant during operation such as those that results in PF and Combustion air leakages if not attended to.

• These include among others production pipe connecting the burner, PA tubes , Elbow end cover plates, Regulation rods, Wind boxes, Air register assemblies, Secondary damper assemblies, Ducting and mechanical actuators.

• Shop fabrication of elbow end cover plates from steel plates

#### 3.1.2 Thickness survey

The following areas to be surveyed

• PA tubes

• Elbows

• Wear plates

• Regulating rods

• Elbow end plates

• Air register vanes in severe cases

• Inserts to be done on PA if holed subject to approval by boiler engineering.

### 3.1.3 Work to be done on the burners during opportunity maintenance

• Minor repair work involving partial or sectional replacement of damaged parts and involving hot work and weld build up on PA pipes

• Regulating rods

• Welding build up on elbow end cover plates and stuffing boxes.

• PA pipes and Elbows to be visually inspected for holes, gasket damages and repaired

• Damper vanes to be inspected for holes and wear

• Repair the wind box skin casing, dampers and any other parts such as inspection doors as well as replacement of gaskets or gland packing

• Inspect wind box casings for corrosion and erosion

• Inspection of all moving parts of the damper control mechanism or mechanical actuators.

• Replacement of pins, nuts, washers and pins and Circlips of the control links and vanes of the air register/damper assembly.

• Servicing of the control mechanism or actuator and recondition accordingly or overhaul when seized. This may include reconditioning or replacement of gears, bearings and bushes.

### 3.1.4 Work to be done on the burners during outages

• Shop fabrication of PA pipes

• Replacement of regulating rods

• Weld repairs of wear plates stuffing boxes in some cases or replacement of elbow end plates.

• Refurbishment or replacement of PA pipes and Elbows based on damage.

• Replacement of Wear plates

• Repair the wind box inspection doors as well as replacement of gaskets or gland packing

• Thickness surveys on wind box casings for thickness and erosion

• Inspection or replacement all moving parts of the adjusting control mechanism or actuator based on damage.

• Replacement of pins, nuts, washers and pins and Circlips of the control links and vanes of the air register assembly.

• Servicing of the control mechanism or actuator and recondition accordingly or overhaul when seized. This may include reconditioning or replacement of gears, control links, bearings and bushes.

## 3.2 UNITS 6-10 PF BURNERS

### 3.2.1 Remove burners

Take note

• Electrical control box to be removed before work is started

• Disconnect electrical cabling adjacent to floor

• Check fuel oil valve close , inlet and outlet above floor

• Hook chain block on centre of the burner to support the weight of the burner (as close as possible) to the wind box

### 3.2.2 Loosening of the bolts

• Start loosening bolts on the face that enters wind box, 40 bolts to loosen welded to casing. There are cast iron blocks that are used to tighten down burner to face of wind box. The cast iron blocks (clips) must be removed and kept in a safe place

• The core air duct must be removed after electrician has disconnected the core air dampers, 24 bolts to be removed

• Production piped must be supported before bolts can be removed, there are blocks (clips) used from production pipe that tighten onto the burner bottom flange

• Air pipes for core air dampers must be removed from valve up to core air damper

### 3.2.3 To take out burner

• The weight must be controlled with a 2 ton chain block

• Two chain pullers on both sides of burner must be operated slowly to prevent the burner hitting the pipes of the oil burner

• When the burner is out, the burner must turn to the opposite side to pass the oil pipes

• After the burners has been removed, it must be secured to the grating before removal of rigging equipment

### 3.2.4 Work to be done on the burner

• Remove the secondary air (SA) Swirlers and make sure that the Swirlers are cut correctly so that they can be refitted after work on burner is completed

• The PA tubes has to be cut close to the face (Bennox)

• The face is ground clean for replacement of pa tubes

• While PA tubes are down the guide plates must be fitted on the inside of the PA tube and stainless tip

• The PA tube prepared (30 deg. angle) as well as the stainless tip according to the old size and the PA tube size to be cut to get correct size.

• All burner sizes to be checked, the length and stainless tip according to the old size and PA tube side to be cut off to get the correct size

• The core air tube must be inspected for holes and broken/missing tiles, if the core air tube is badly worn then it has to be replaced with new one

• When replacing PA tubes, ensure that they are fitted to the face

• Repair burner casing window patching subject to the approval by the system engineer responsible for the plant or replace complete section with new.

• Welding must be 20mm

• Use correct or reasonable amount of welding current in all cases to avoid excessive spatter and ensure slack is always removed without exception.

• Inspect and renew eroded liners

• Secondary air swirlers adjusting link/arm to be removed

• Secondary air  swirlers adjusting link/arm stuffing boxes to be opened and refurbished

• Secondary air swirlers arm reduction gearboxes to be opened, cleaned, greased and closed

• Secondary air swirlers have to be replaced in same position with the fitted round bar.

• The oil burner swirlers must be a distance of 300 mm from the tip of the burner when replaced.

### 3.2.5 Other work to be done on burners and core air ducting.

• Welding build up on face plate

• Welding build up on front plate

• Inner and outer doors to be visually inspected for holes

• Round bar for gasket on door to be checked

• Square to round must be inspected for holes

• Core air duct to be inspected for holes and wear

### 3.2.6 Other work to be done on Core air ducting

• Refurbish all damaged damper seats for tight air sealing based on damage.

• Inspections for leakages, damper alignment and repairs and replacement

• Replacement of damaged of bearings/bushes where applicable and other miscellaneous components.

• Inspections and testing of pneumatic actuators of core air dampers.

• Removal and installation of pneumatic actuators of the core air dampers.

### 3.2.7 Thickness survey

The following areas to be surveyed

• PA tubes

• Front plate

• Face plate

• Inserts to be done on face plates if holed

• Half-moon rear

• Square to round core air

• The lagging and cladding must be removed around the burner box and the entire burner box wall thickness checked and also inspected for any holes.

## 3.3 QUALITY ASSURANCE TESTS, INSPECTIONS AND DOCUMENTATION

The following documentation, inspections and tests are required.

### 3.3.1 Provision of certificates and technical data

a. The *Contractor* shall submit a QIP to Eskom for the required activities which need to be carried out.
b. The *Contractor* should also provide a time base repair schedule to Eskom prior to starting the work.
c. The following data must be provided by means of an official report:
    1. Thickness reports/surveys
    2. Serial Numbers where applicable.

3. Material Certificates for all consumables used.

### 3.4 EFFECTIVE DATE

This document will be effective from the date that the contract is authorised.

### 3.5 WORKS

Refurbishment of the PF Burners as outlined in the SOW above.

**Table 1: Spares List**

| Material No. | Short Description | Long Description |
|---|---|---|
| N/A | | |

### 3.6 MATERIAL CERTIFICATES AND GUARANTEES

The following documentation must be supplied to the *Employer*'s representative before any item is accepted on site:

- All documentation, but not limited to, as detailed in section 3.3 of the scope of work above.

### 3.7 GENERAL REQUIREMENTS

Other PF Burners related work required on an as and when needed basis subject to approval by both the *employer* and the *contractor*.

## 4 AUTHORISATION

This document has been seen and accepted by:

| Name | Designation |
|---|---|
| | |
| | |
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| | |
| | |

## 5 REVISIONS

| Date | Rev. | Compiler | Remarks |
|---|---|---|---|
| | | | |
| | | | |

## 6 DEVELOPMENT TEAM

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

Eesa Ebrahim

## 7 ACKNOWLEDGEMENTS

N/A