Eskom	SOW	Camden Power Station

Title: **REFURBISHMENT OF MAIN COOLING WATER PUMPS GEARBOX**

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Content

Page

1. Introduction 3
1.1 Purpose 3
1.2 Applicability 3
2. Definitions and Abbreviations 3
2.1 Definitions 3
2.2 Abbreviations 4
3. Roles and Responsibilities 4
4. Scope 4
4.1 Applicability 4
4.2 Normative/Informative References 4
4.3 Normative 5
4.4 Informative 5
5. Background 5
6. Equipment Specification/Description 5
7. Quality Control Documentation 5
7.1 Certificates, Data Packs & Reports 6
7.2 Drawings and OEM Information 6
7.3 Inspection Requirements 6
7.4 Testing Requirements 6
7.5 Workshop Based Refurbishment 6
7.6 Manufacturing and supply of spares 7
8. Detailed Scope of Work 8
9. General Requirements 9
10. Tender Returnable 10
11. Revisions 11
12. Acceptance 11

1. Introduction

This document outlines the work required on the Camden cooling water pump gearbox that was received from Hendrina Power Station. The gearbox was kept as a spare for Hendrina power station and has been kept in unfavourable condition for a long time, therefore, the gearbox is in bad condition. The gearbox will have to be sent to a gearbox repairer for full refurbishment. The gearbox will have to be repaired according to the OEM requirement and specification, and the replacement parts should be as per the OEM design drawings (like for like replacement).

1.1 Purpose

The purpose of this document is to act as a guideline for the refurbishment of the main cooling water pump gearbox installed at Camden Power Station. The refurbishment is to be conducted at a reputable off-site workshop which meets the quality requirements stipulated by Eskom.

1.2 Applicability

The document is relevant and applicable to the following departments:

- Turbine engineering
- Turbine maintenance
- Materials Management Department
- Camden Procurement Department
- Camden Management
- Potential Contractors

2. Definitions and Abbreviations

2.1 Definitions

Eskom: Used for Eskom Holdings Limited, its divisions and wholly owned subsidiaries.

Refurbishment: Overhauling of any equipment or part thereof to reinstate the performance of the equipment to its original design specification.

2.2 Abbreviations

CW: Cooling Water

GBX: Gearbox

ISO: International Standards Organisation

PMP: Pump

QCP: Quality Control Plan

QM: Quality Management

3. Roles and Responsibilities

Contract Manager: Drive the tender process to effectively establish and manage the contract to execute the scope of work as presented in this document.
Contractor: Execute the scope of work stipulated in this document and conform to all the requirements set out in the scope of work and the final contract.
Quality Department: Responsible for ensuring that all stipulated quality documentation and processes are adhered to in conformance with the requirements stipulated in this scope of work and the QM58 standard.
System Engineer: Responsible for technical specifications, the technical evaluation as well as any deviations that might be encountered during the execution of the scope of work. Ensure the adherence to quality, legal and ISO standards.

4. Scope

4.1 Applicability

This document shall apply to Camden Power Station only.

4.2 Normative/Informative References

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

4.3 Normative

[1] ISO 9001 - Quality Management Systems

4.4 Informative

[2] ISO 9001 Quality Management Systems

[3] QM 58 Supplier Contract Quality Requirements Specification

5. Background

This is a spare gearbox borrowed from Hendrina Power Station. The gearbox was not correctly preserved, therefore require full refurbishment to restore its condition. The gearbox will be installed on MCW pump 7 once refurbished.

6. Equipment Specification/Description

Epicyclic Vertical Installation Gearbox – 749251

Model: Allen Epicyclic Gear
Type: Planetary
HP: 2600
Input RPM: 990
Output RPM: 216

7. Quality Control Documentation

- Quality management during execution of any activity must be according to the requirements stipulated in QM58 document governing all Eskom related activities.
- As a bare minimum requirement any work being executed must be executed according to a QCP (quality control document) that is pre-approved by the system engineer with relevant intervention points that must be adhered to.
- All QCPs must be accompanied by an execution programme with completion dates and durations of all activities on the QCPs.
- Final test run, with confirmation that the vibration levels are within the acceptable levels (BS ISO 20816 latest revision).

7.1 Certificates, Data Packs & Reports

The following reports must be generated and supplied to the client before, during and after the execution of work:

- **Balancing Certificates:** Must be included in the Data Pack with delivery to site and in accordance with the QCP requirements.
- **Material Certificates:** Must be included in the Data Pack with delivery to site and in accordance with the QCP requirements.
- **Data Packs:** Must be delivered with any item worked on or supplied under this contract and must include all documentation relevant to a particular component or work executed.

7.2 Drawings and OEM Information

All spares and components used should be as per the OEM standard as far as reasonably practical and where deviations are required it must be approved by the System Engineer in writing. Any modifications to the equipment must be done in accordance with the Eskom Reverse Engineering procedure with full involvement from the System Engineer.

7.3 Inspection Requirements

Inspection report must be submitted to Eskom Camden Engineer for review and approval.

7.4 Testing Requirements

It is required that testing of the gearbox is be done in the presence of the client (Eskom) and the service provider during commissioning. Testing of the gearbox will be done during commissioning of the main cooling water pump at Camden Power Station, and the service provider will be notified on time in order to prepare. Eskom and the service provider needs to confirm that the vibration levels are within the relevant ISO standard, all temperatures are normal and the gearbox is functioning as intended.

7.5 Workshop Based Refurbishment

This section state requirement for workshop works to be executed by the prospective contractor and must be allowed for in the offer.

The contractor will be responsible for all the activities and related activities that might emanate from these main activities as stated below:

- Only the work approved on the accepted strip down report may be executed and must adhere to the approved programme.
- Refurbishment cost and refurbishment programme must be submitted to the contract manager for approval of refurbishment.
- All manufacturing of components or repair work to old components must be carried out according to the OEM specifications and where these are not applicable, acceptable international standards must be followed. However, where deviating from the OEM specifications, the proposed method or other specification that will be followed must be approved by the System Engineer.
- All work that will be done by subcontractors must be subjected to the same documentation and technical requirements as imposed on the main contractor.
- A defects period of 4500 operating hours will apply to any pump or component refurbished or supplied by the contractor. Any item that fails under the defects period must be removed from the plant within 24 hours of failing and replaced or repaired within 24 hours from removal from the plant at the contractor's cost with no compensation. If the contractor disputes the failure not to be a defect on his part, it must be raised to the contract manager and NEC process followed to resolve the dispute.

7.6 Manufacturing and supply of spares

This section state requirement for manufacturing and installation of replacement parts to be executed by the prospective contractor and must be allowed for in the offer.

- As far as reasonably practical OEM spares must be used and supplied.
- All manufacturing of components must be carried out according to the OEM specifications and where these are not applicable acceptable international standards must be followed. However, where deviating from the OEM specifications, the proposed method or other specification that will be followed must be approved by the System Engineer.

8. Detailed Scope of Work

SUBSYSTEM		COOLING WATER PUMP GEARBOX		
COMPONENT ACTIVITIES			GOVERNING DOCUMENTS	
№	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	CHECK SHEET NO.	INTERVENTION POINTS (H/W/R)
1	Spindles	Repair	Inspection report	R
2	Output ring gear	Repair	Inspection report	R
3	Sun gear	Repair	Inspection report	R
4	Bottom ring gear	Repair	Inspection report	R
5	Ring gears	Repair	Inspection report	R
6	Gear carrier	Repair	Inspection report	R
7	Planetary Gears	Repair		
8	Oil buffer	Repair		
9	Oil Pump	Repair		
10	Reduction pinion	repair/replace	Inspection report	R
11	Bolts/washers	Replace with new		
12	Heli coils	Install new		
13	Oil spray pipes	Recondition/Install new		
14	Output shaft	Drill new dowel holes as to match and align with the gearbox dowel holes PCD. Holes must be drilled in between the existing dowel holes.	Check sheet	H
15	Sub assembly	Balance	Balance certificate	R
17	Gearbox hosing	Machine gearbox housing top to accommodate top ring spigot.	Check sheet	H
18	Gearbox hosing	Sleeve gearbox housing dowel holes to reduce sizes	Check sheet	H

SUBSYSTEM		COOLING WATER PUMP GEARBOX		
COMPONENT ACTIVITIES			GOVERNING DOCUMENTS	
№	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	CHECK SHEET NO.	INTERVENTION POINTS (H/W/R)
		down to 39mm diameter which will match the gearbox stool holes.		
19	Assembly	Assembly gearbox and install on the casing. Install gearbox casing on the stool and ensure that they are well centred. Install the dowel bolts and ensure that they are tight on the casing and stool.		

9. General Requirements

This section states some general requirements

- The contractor must comply with all the site regulations issued by the employer.
- The contractor must provide all necessary tools and equipment to carry out the requirements set out in the contract.
- All work is valued or measured in accordance with the price list. Rates for items are deemed to include for the supply of delivery, installation, erection, or connection complete unless otherwise specified.
- Actual quantities will be determined based on the requirements of the task order. The contractor must provide all necessary information required by the employer to determine the cost at the assessment date for the task order.
- The contractor will be liable for any damages / accidents when gearbox is collected / delivered at the power station.
- The contractor shall always adhere to Camden's lifesaving rules, safety rules and regulations.

10. Tender Returnable

Table 1: Technical Evaluation Criteria

Qualitative Technical Criteria Description	Reference to Technical Specification / Tender Returnable	Proof (%)
ISO 9001 Certification	Certificate registered in the name of the company tendering for the contract, certified by commissioner of oath and not older than 6 months.	Submit valid Certificate
RELATED COMPANY EXPERIENCE	• Proof to be submitted as appointment letters and completion certificates, with traceable references. • Start and Finish dates must be included on Appointment letters and completion certificates. • Clients company Emblem or Logo must be on appointment letter and completion certificate. • Appointment letters and completion certificate must be sign by all party's including client. • All documentation must be not older than 3 years.	Submit letters and certificates as stipulated
Quality Control Plan (QCP)	Provide at least three QCP documents for gearbox repairs (Signed off by all parties), for three different projects completed in the past three years.	Submit company QCP's
Gearbox Assembly Balance Certificates	Provide at least two balance certificates for two different gearboxes not older than two years.	Submit balance certificates
CIDB Grade Level 4ME.	Provide valid certificate	Submit valid certificate

11. Revisions

Date	Rev.	Compiler	Reasons
15-09-2022	1	Sabelo Mthethwa	Original

12. Acceptance

This document has been seen and accepted by:

Name	Designation	Signatures