

	SCOPE OF WORK (SOW)	TURBO GEN SERVICES (TGS)
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Title: Works Services Contract – Bearing refurbishment

Unique Identifier: N/A

Alternative Reference No.: N/A

Area of Applicability: Eskom Rotek

Industries (ERI) SOC Ltd.

Document Type: Scope of Work (SOW)

Revision: 0

Total No. of Pages: 13

Next Review Date: N/A

Classification: Controlled Disclosure

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1 Objectives

The objective of this document is to outline bearing refurbishment (remetalling) services required by ERI TGS to service all Eskom Power Stations. The contract seeks to ensure that the proposed services required are executed in a planned and structured manner, and that all quality requirements during inspection, refurbishment and final testing are met. This contract should ensure that the project is completed within the specified timeframe, consumables are readily available, and the refurbishment scope is executed efficiently. All scopes need to be executed in a way that supports the project duration.

2 Scope of services

The scope of responsibility includes the complete or partial refurbishment of white metal bearings. The refurbishment process primarily includes as received inspections, removal of the old white metal, remetalling, final machining and conducting inspections before dispatch of the bearing.

3 General Requirements

3.1 Quality

- Inspections are to be carried out in accordance with the check sheets and quality plan provided by the service provider in line with the Eskom requirements, which should be compiled from the Scope of Work (SOW) and approved by Eskom Rotek Industries (ERI) Turbo Gen Services (TGS) Engineering. The document must contain all the Product Quality Plans (PQP's) of work that will be done. Inspection values to be recorded on the check sheets. All abnormalities are to be recorded and reported via Technical Notifications (TNs).
- All the work carried out will be in line with the applicable Eskom, ERI or OEM standards. Where nothing exists, IEC, SABS standards and good engineering practice will be followed. This includes but is not limited to the covering of all openings and the use of approved chemicals.
- NDT to comply with ERI standards for Penetrant or liquid penetrant testing (PT) and Ultrasonic Testing (UT)
- All quality documents, procedures, check-sheets and PQP to be supplied by the service provider providing the service and approved by ERI TGS Engineering.

3.2 Experience of staff

- The service requested will determine the skill levels and number of specific skills that will be required to execute the service.

- The service provider will work together with the ERI TGS personnel to ensure the KPIs are achieved.
- All staff shall be adequately qualified and competent at performing all work within safe and correct technical specifications.

3.3 Spares and Consumables

- All spares that would have been pre-identified in the pre-planning of the project will be sourced and supplied by the respective clients to ERI.
- All consumables that would have been pre-identified in the pre-planning of the project will be sourced and supplied by the service provider.
- The transport of any spares and consumables remains the responsibility of the contractor.

3.4 Documentation

- A full-service report will be compiled to ERI TGS standard and provided to ERI TGS on dispatch of the bearing. The report will contain a high-level description of the work performed during the project. It will contain the approved PQP of all work and all related check sheets including all technical notifications.
- PQP to be compiled and presented to Engineering (ERI TGS) for approval before the start of the project.

4 Scope of Work (SOW)

4.1 *Pre – Project Activities*

- Upon receipt of the scope of work, it is the service provider's responsibility to ensure that the scope is clear and executable within the specified durations. The ERI TGS project management will share durations of activities expected to support whole project durations.
- Identify critical spares requirements and incorporate into the scope of works.
- Verify scope execution methods against ERI prescribed methods for inclusion in the scope of work.
- Advice and guide on best practices to refurbish bearings to meet the project deadlines.
- Develop and review project plans for logics and detail as per scope of work for approval

4.2 *Service Provider Service*

4.2.1 Bearing Refurbishment

- Perform as received inspection of bearings (visual and dimensional)
- Remove all white material and inspect the shell
- Blast clean the bearing
- Inspection of dowels and fasteners.
- Apply Tin layer on the bearing
- White metal the bearing
- Butt, peen, scrape and rough machine the bearing
- Deburr and clean
- Record bearing half joint feeler gaps, submit this record with refurbishment data package.
- Perform bearing half joint blue check and correct by hand scraping or machining if required.
- **NOTE: Consult ERI Engineer if bearing half joint machining is required.**
- Record bearing half joint feeler gaps after machining the half joint minimum to clean, submit this record with refurbishment data package, **if required**
- Perform bearing half joint feeler gaps after machining the half joint minimum to clean, **if required.**
- Perform NDT (UT and PT) and submit report to engineering (third party to have required accreditation and accepted by Eskom Rotek Industries / Eskom)
- Dimensional inspection after rough machining
- Butt, peen and scrape the bearing ensuring critical dimensions are maintained
- Supply or manufacture dowels, bolts and nuts when instructed by ERI when required
- Engineering to issue final machining sizes
- Final machine the bearing to specified size
- Reintroduce all critical features (oil ways, jacking oil ports, thermocouple holes etc.)
- Dimensional inspect after final machining
- Perform NDT (UT and PT) after final machining and submit report to engineering
- Deburr and clean
- Package bearing to avoid damages on white metal circumference, butt faces and bearing body
- Verify all documentation for dispatch

NB: Final machining of specific bearings to be done in conjunction with the final machining instructions from ERI which must include reference to the bearing setup and where the specific housings in which the shells must be installed before machining.

4.2.2 Instructions, Rule, Roles and Responsibilities to be complied with by the Service Provider

- Compile and share program with ERI Project Manager before commencement of work

- Share third party certification for NDT and any quality related work as required by ERI standards
- Adhere to workshop ERI Life Saving rules and observe safety habits attitude and compliance there of
- Seek advice if required before continuing with an activity which needs clarification
- Ensure that plant safety regulations, quality standards & procedures, work instructions are always adhered to.

4.2.3 Comply with Safety Health Environment and Quality Requirements

- Comply with the Occupational Health and Safety Act and ERI SHE System requirements
- Comply with the Eskom Plant Safety Regulations and Life Savings Rules
- Control and maintenance of ISO Quality system in accordance with the Business Management System in relation to this Job Function.
- Comply with policies, procedures and instructions.

5 Minimum qualification requirements

Resources assigned to the project are to comply with the minimum qualification requirements below:

Casting Artisan	<ul style="list-style-type: none">• At least 5 years relevant experience• Must be fully literate in English, in reading, writing and speaking, and able to communicate in English.• Strong & sound relevant trade skills with the ability to utilize and read measuring and test instruments within the tolerance requirements• Conversant with Quality and Safety system requirements• The ability to function effectively in a team environment
Dye Penetrant Technician	<ul style="list-style-type: none">• At least 5years relevant experience• Must be fully literate in English, in reading, writing and speaking, and able to communicate in English.• Strong & sound relevant trade skills with the ability to utilize and read measuring and test instruments within the tolerance requirements• Conversant with NDT requirements• The ability to function effectively in a team environment
Mechanical Engineer	<ul style="list-style-type: none">• 5 years relevant experience• Must be fully literate in English, in reading, writing and speaking, with technical report writing skills and able to communicate in English.• Above average interpersonal, communication and leadership skills• Strong customer orientation• Conversant with ISO 9002 and Occupational Health and Safety Act• Computer skills, in MS Office, Windows, and MS Projects• Diploma, or Degree in the relevant Engineering field

Machinist	<ul style="list-style-type: none"> • At least 5 years relevant experience • Must be fully literate in English, in reading, writing and speaking, and able to communicate in English. • Strong & sound relevant trade skills with the ability to utilize and read measuring and test instruments within the tolerance requirements • Conversant with Quality and Safety system requirements • The ability to function effectively in a team environment
NDT Ultrasonic Technician	<ul style="list-style-type: none"> • At least 5 years relevant experience • Must be fully literate in English, in reading, writing and speaking, and able to communicate in English. • Strong & sound relevant trade skills with the ability to utilize and read measuring and test instruments within the tolerance requirements • Conversant with NDT requirements • The ability to function effectively in a team environment
NDT level III	<ul style="list-style-type: none"> • 5 Years of NDT related experience with strong interpersonal and communication skills • Set-up and verify equipment settings

	<ul style="list-style-type: none"> • Translate NDT codes, standards, specifications, and procedures into NDT instruction adapted to the actual working condition • Prepare NDT Work Instruction / Technique sheets • Perform and supervise inspections.³ • Evaluate and interpret NDT results and provide credible results. • Select the NDT Technique for the test method to be used • Train and develop and NDT Technicians
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6 SHEQ requirements

All service providers are expected to comply with, but not limited to the following:

- Compliance with the Occupational Health and Safety Act 85 of 1993 is compulsory.
- Adherence to Quality Management System Policies, Procedures and related requirements of ISO 9001.
- Adherence to Occupational Health and Safety Policies, Procedures and related requirements of the OHSAS 18001.
- Adherence to environmental aspects, related impacts and legal requirements associated with work activities in accordance with ISO 14001.
- Adherence to Life Saving Rules.
- Only authorized documents and processes are to be used in the execution of duties.
- Continuously seek methods for improvements from a process, quality and safety perspective.
- Obey all the lawful instructions.
- Familiarize with:
 - ✓ The applicable work instructions and procedures in place.
 - ✓ Safe working conditions and procedures.
 - ✓ All legal and contractual requirements.
 - ✓ Discipline and integrity.
- Compliance with all ERI Work Instructions, processes, procedures, and standards

- Adherence to ERI's disciplinary code or practice.
- Set examples for co-workers and others.
- Participate in Risk Assessments.
- Responsible for own safety.
- Responsible for Personal Protective Equipment issued.
- Execute duties promptly and safely.
- Safeguard tools and safety equipment issued.
- Keep good relationship with all personnel.
- Compile a HIRA for each activity that needs to be performed.
- Ensure the activities are carried out following a works instructions and procedure.
- Adherent to clean condition policy where required.

- All activities to be carried out as per the documented processes and comply with the requirements of ISO and OHSAS certification
- Service provider to comply with Eskom PPE (Personal Protective Equipment) policy with regards to issuing of PPE to resources
- Proper use of PPE to be followed
- Ensure that tools and equipment are stored correctly in a safe place.

7 Key deliverables

The following deliverables are to be met by the service provider:

During the project duration:

- Program and contract agreement detailing start and end date of project signed by both parties
- Daily updated program
- Compliance with all ERI work instructions, processes, procedures, and standards
- No SHEQ incidents
- Project milestones are to be achieved on time, or earlier

8 Procedure adherence requirements

The ERI TGS Quality Management System consists of various procedures and processes that are utilized to manage and control the level of quality of maintenance activities during an outage to an acceptable standard. These procedures and processes are employed during the planning and execution of maintenance activities with a focus on meeting the customers' requirements and enhancing their satisfaction. These procedures should be adhered to by the service provider and will be made available on request by the service provider.

- Quality Control
- Technical Notification Work Instruction (240-94067868)
- Latest revision of ERI PT (240 – 136514971 R3) and UT (240 – 136619126) NDT criteria
- Latest revision of acceptance criteria for white metal bearings (TT-T-46)

9 Key Performance Indicators

The performance of the contractor will be evaluated on the KPIs in the table below:

Objective	Key Performance Indicator	Measure	Unit of Measure	Source of Evidence
Safety Sustainability	LTI Free days	LTI Free days	Days	To be provided by the supplier
Due Date Performance (DDP)	Due Date Performance	Average days as per the signed refurbishment scope of work program. Days earlier reward: <i>Supplier still charges full contracted value for earlier finish</i> Days late penalty: <i>2% of payable on late delivery per day</i>	Days	To be provided by the supplier
Reduce number of rework incidents	Number of Rework Incidents	Number of Rework Incidents Rework at supplier cost including spares and consumables and recovery plan if there are contractual dates impacts (penalty will be as per DDP)	Number	To be provided by the supplier
No of Legal & Environmental Contraventions	No of Legal & Environmental Contraventions	Number of contraventions	Number	To be provided by the supplier

- The service provider will be responsible for the successful completion of the scope
- Any defects that are noted after the scope execution will be corrected by the service provider at their own cost.