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|  | SCOPE OF WORK (SOW) | TURBO GEN SERVICES (TGS) |
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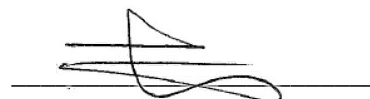


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1 Objectives

The objective of this document is to outline the services that are required from the Authorised Inspection Authority (AIA) or Examining companies to service the Eskom Rotek Industries and 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 shall ensure that the project is completed within the specified timeframe, consumables are readily available, and the refurbishment scope is executed efficiently. All scope needs to be executed in a way that supports the project duration.

2 Scope of services

The scope of responsibility includes the supply of third-party independent inspection during the process of qualifying welding procedures, welders, operators, and brazers. The scope will include some or all of the following:

- (i). verify that all welding and/or brazing procedures and all welders, operators, and brazers are tested and qualified to the latest ASME Code Section IX, BS EN ISO 15614, BS EN ISO 15613, BS EN ISO 9606 and applicable Code of construction,
- (ii). and inspect by NDT and mechanical tests in preparation of the procedure qualification record, and welders, operators and brazers' qualification record.

3 General Requirements

3.1 Quality

- Inspections to be carried out in accordance with check sheets and master quality plan provided by ERI in line with the Eskom requirements, which should be compiled from the Scope of Work (SOW) and approved by Engineering (Eskom and ERI TGS). The document must contain all the Product Quality Plans (PQP's) of work that will be done. Inspection values to be recorded for all check sheets. Damaged sustained to components resulting in an out of specification must be managed by a concession obtained from engineering staff. All abnormalities to be recorded and reported with Technical Notifications (TNs).
- All work carried out will be in line with the applicable Eskom or OEM standards. Where nothing exists, IEC, SABS standards and good engineering practise will be followed. This includes but is not limited to the covering of all openings and the use of approved chemicals.
- All quality documents, procedures, check-sheets and PQP to be supplied by ERI TGS

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 of performing all work within safe and correct technical specifications.
- Short CV's of all staff, stating qualifications and relevant experience must be provided at least four weeks before commencement of project.

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 respective 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 and provided to TGS, to the ERI TGS standard. The report will contain a high-level description of the work done during the project. It will contain the approved PQP of all work and all related check sheets. All technical notifications will be shown as well. It will contain a section on spares used report.
- PQP to be compiled and presented to Engineering (TGS) for approval before start of project. Report to be accepted by ERI TGS Engineering.

- The supply of new machinery is to be accompanied by a complete operation and maintenance manual which must be reviewed by engineering before any purchase is made.

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 practises to hone to meet the project deadlines.
- Active involvement in the compilation of Project Plans in Primavera
- Develop and review project plans for logics and detail as per scope of work for approval

4.2 Service Provider Service

During the process of qualifying welding and/or brazing procedures and all welders, operators, and brazers, third-party inspector is required to verify welding and testing of test coupons to qualify welding to the latest ASME Code Section IX, BS EN ISO 15614, BS EN ISO 15613, BS EN ISO 9606, and applicable Code of construction.

4.2.1. Welding/Brazing Procedure Qualification.

preliminary Welding Procedure Specification (pWPS) will be used to provide welding parameters such as dimensions, joint configuration, consumable type etc.

4.2.1.1. Verify transfer of heat number on test coupon.

4.2.1.2. Verify weld preps and fit-ups.

4.2.1.3. Verify welding process (i.e. position, pre-heat, consumables, voltage, amperes, welding speed, and etc.

4.2.1.4. Arrange, reviewing / witnessing and evaluation of NDE (e.g., Radiography).

4.2.1.5. Arrange, reviewing / witnessing and evaluation of mechanical tests (Tensile test, Bend test, Impact test, Hardness test, Peel or Sectioning tests and other required tests and examinations have been performed by qualified personnel; the results meet Code requirements and are properly documented.

4.2.1.6. Record and approve Procedure Qualification Record.

4.2.2. Welder, Operators and/or Brazers Qualification Record.

Rotek WPS will be used to provide welding parameters such as dimensions, joint configuration, consumable type etc.

- 4.2.2.1. Verify transfer of heat number on test coupon.
- 4.2.2.2. Verify weld preps and fit-ups.
- 4.2.2.3. Verify welding process (i.e., position, pre-heat, consumables, voltage, amperes, welding speed, and etc.
- 4.2.2.4. Arrange, reviewing / witnessing and evaluation of NDE (e.g., Radiography).
- 4.2.2.5. Arrange, reviewing / witnessing and evaluation of mechanical tests (bend test, fracture test, Peel test and other required tests and examinations have been performed by qualified personnel; the results meet Code requirements and are properly documented.
- 4.2.2.6. Record and approve Procedure Qualification Record.

4.3 Instructions, Rule, Roles and Responsibilities to be complied by Service Provider

- Report directly to the allocated Employer Welding Supervisor.
- Receive their daily SOW from their supervisor and execute as per quality requirements and documentation in the production package
- Attend to daily toolbox talks on topics related to daily activities and ensure that Hazard Identifications and Risk Assessments (HIRA's) are in place, adhered to, and ensure compliance to Personal Protective Equipment (PPE) requirements.
- Ensure the work areas are safe in terms of housekeeping, storage, stacking, machine guarding
- Seek advice if required before continuance with an activity which needs clarification
- They will ensure total compliance to the access-controlled areas around the machines
- Ensure that plant safety regulations, quality standards & procedures, work instructions are always adhered to.

4.4 Comply With Safety Health Environment and Quality Requirements

- Comply with the Occupational Health and Safety Act and Rotek Engineering SHE System requirements
- Comply with the Eskom Plant Safety Regulations.
- Stop unsafe work activities and report to the Project / Site Manager for rectification
- 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:

| | |
|---------------|---|
| IPE Inspector | <ul style="list-style-type: none"> • At least 3 years relevant experience • IPE Certification • Welding and Fabrication Inspector Level II Certification. • Must be fully literate in English, in reading, writing and speaking, and able to communicate in English at all times. • Knowledge, Skill, & Abilities. • Knowledge of ASME Code Section IX, BS EN ISO 15614, BS EN ISO 9606. • Knowledge of Quality Control Systems, programs and shop and field procedures. • Knowledge and ability to evaluate and monitor shop and field procedures and performance. |
|---------------|---|

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.
- Compliance with the Eskom Plant Safety Regulations.
- Only authorised 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 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 to all ERI Work Instructions, processes, procedures, and standards
- Adherence to ERI's disciplinary code or practice.
- Set example to 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 and every activity that needs to be performed.
- Ensure the activities are carried out following a Works Instructions and Procedure.
- Adhere 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 to 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:

- PQR documentation
- WPQ documentation
- No damage to components, equipments, and plant.
- No customer complaints
- Compliance to all ERI Work Instructions, processes, procedures, and standards
- No SHEQ incidents
- Milestones to be provided and 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 of meeting the customer's requirements and enhancing their satisfaction. These procedures shall be adhered to by the service provider and will be made available on request by the service provider.

- Execution and Control of All Site Work (240-137025973)
- Quality Control
- PQP Workflow Assessment and Tracking for Outages (F-198)
- Technical Notification Work Instruction (240-94067868)
- Standard for Welding requirements on Eskom Plant (240-106628253)
- ASME Boiler & Pressure Vessel Code sections IX.

- Specification and Qualification of Welding Procedures for Metallic Materials – Welding Procedure Test (BS EN ISO 15614 part 1, 2, 3, 4, 6, 7, 11).
- Specification and Qualification of Welding Procedures for Metallic Materials – Qualification based on pre-production Welding Tests (BS EN ISO 15613).
- Qualification Testing of Welders (BS EN ISO 9606)
- Control of Blanks and Foreign Material Exclusion Covers (T-03)
- Rotor Lockable Components Inspections (E-67)
- Hydraulic Equipment Specifications, Operation and Maintenance Requirements (F-465)
- Compilation of Service Reports and Data Books (F-737)
- Lifting Machines and Lifting Tackle Safe Working Practices (E-19)
- Management and Control of Tools in a Tool Store or a Container (240-125904456)
- Correcting of Checksheets Engineering Instruction (X-1384391-033)
- Project Management Product/Process Quality Plan (240-130329202)
- Control of Non-Conforming Product/Service, Corrective and Preventive Action (240-103649507)
- Business Management System Audit (240-94027195)
- Coding of Business Management System Documentation (240-94027233)
- Development and Management of the Product/Process Quality Plan for Outages (240-142892057)
- Generator Clean Conditions Requirements Work Instruction (240-56178527)
- Turbo Gen Services - Outage Quality Control Cabin (240-142894278)
- Turbo Gen Services Rework Work Instruction (240-147200671)
- Flogging procedure (E-60)
- Safe operation of electrical equipment (TT-A-01)
- Plant Safety Regulations

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 supplier |
| Due Date Performance | Due Date Performance | Average contracted outage days | Days | To be provided by supplier |
| Reduce the Number of Rework Incidents | No of Rework Incidents | Number of Rework Incidents | Nr | To be provided by supplier |
| Reduce the Rework Duration | Rework Duration (Days additional to planned outage duration) | Number of Days Rework Duration Impacts Outage Due Date | Days | To be provided by supplier |

| | | | | |
|--|--|-----------------------------|----|-------------------------------|
| No of Legal & Environmental Contraventions | No of Legal & Environmental Contraventions | Number of contraventions | Nr | To be provided by supplier |
| Zero Fatalities Excl 3rd party at fault | Zero Fatalities Excl 3rd party at fault | Number of fatalities | Nr | To be provided by supplier |

- The service provider will be responsible for the successful completion of the scope.
- Supply signed and dated PQR and WPQ documentation
- Any features that would be rejectable shall be noted and report issued with reasons.