

Title: **SOW for Turbine Engineering
Technical Integrated System**

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SOC Ltd

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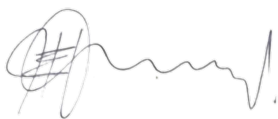
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Compiled by



Mpho Nengovhela
Snr Industrial Engineer

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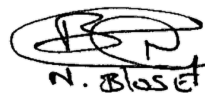
Functional Responsibility



Reinaldo Da Veiga
Service Manager –
Quality and Engineering

Date: 03/03/2025

Authorized by



Nhlakanipho Blose
Service Manager-
Maintenance

Date: 03/03/2025

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1. Objective and Background

The purpose of the document is to outline the background and requirement for the Turbine Engineering Technical Integrated System (TETIS) tool that will be utilized on the turbine space on outage execution and /or maintenance of power plants.

In line with continuous improvement drive by the organization to improve projects/outage turnaround time, recent project interventions by the engineering team have indicated the need to improve on-time projects quality technical information input to a centralized system that has automated features to support prompt engineering decision making is imminent.

ERI Turbo Gen Services (TGS) team lacks technological inclined system to integrated engineering data capturing, collaboration, intelligent decision making and later turn the data into information in the organisation. The organisation is currently utilizing a traditional heavy paper system when conducting outages on powers plants (turbines, generators, auxiliaries, and other plants). Furthermore, the current systems in place does not support the organization in tracking / tracing technical real time information to stakeholders and /or engineering team throughout the refurbishment process as it is manual and paper dependent. The current checksheet management system is centralized to a particular site and information is only available on that site. Information movement is dependent on availability of individuals on site leading to delays in engineering decision making and archiving for references.

and check-sheet documentation are manually captured on traditional control documents hard copy system and later stored in paper format. Access to information takes long and it further compromises productivity and efficiencies on project execution.

The intent is to drive the organization from a traditional heavy paper checksheet management system to a digital system that is more inclined with the recent industrial revolution trends by providing automated system to assist engineering in automated decision making, improving turnaround time on technical decision making that will subsequently lead to reduce outage duration and improve Energy Availability Factor (EAF).

The document outlines the problems to be addressed, proposed solution, benefits to the organisation etc. The intent is meant to benefit the organization in advancing projects turnaround time; data integrity; data security, quality improvement; project on time technical decision making and ability to monitoring and create ease on information accessibility etc.

The required system must specifically focus on (Check sheets and flow of check sheet) as well as technical information integration on outages and maintenance projects in power plants.

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2. Scope of Work/Business requirements

2.1 High level requirement

The high-level requirement for the business is to have a stand-alone centralized integrated digital system with automated control documents and storage for technical data with a capability of real time collaboration between site and engineering during outage/maintenance execution of power plants for checksheets.

2.2 Deliverable

Develop, Implement, train, and provide system maintenance of a centralize system to digitalize the control documents (Check-sheets, **(Check Sheet Specimen Ref 1)**) system with a capability of approval and rejection of the inputs by high level technical and engineering hierarch and escalation thereof. The system must be capable of promptly producing engineering check sheet report at the end of the outage and/or maintenance project. The supplier must also supply robust handheld tablets (Tough book). All designs specifications must be loaded on the developed system with intelligent decision-making capabilities. The solution must include automatic notification and escalation of out of specification conditions.

2.3 Detail Requirements

- Supply robust handheld tablet (Tough Book) x 30 units per Station. **(Robust handheld tablet (Tough book) specification Ref 2.)**
- Build electronic system into the Tough Book to computerise checksheets for outages and maintenance projects per station.
- Digital control document system: The supplier must develop, implement engineering assistance system, and train employees to create future checksheets.
- The system must have a built-in parameter to assist engineering in decision making during refurbishment of power plants. The system must have the capability to escalate and notify Supervisor, Technicians, Engineers (ERI; Client & OEM) and Seniors as soon as technical out of specification conditions are identified.
- The system must allow employees to retrieve checksheets from storage for ease of reference during outages.
- The system must allow employees to fill inputs from actual measurements instead of utilizing paper for data storage.
- The system must provide a platform to escalate the approvals of technical information to high level.
- The system must present real time status of technical inputs.
- The system must present the ability to verify inputs electronically with electronic signatures features.
- The system must be IOS and Android compliant.
- The system must provide a wireless connection capability.
- The system must be able to analyse the data and present information on reporting. This must be built into the system.
- A list of Power plants **(List of Power Station Ref 3)** is attached where the solution will be utilised. On full implementation that will include all Eskom Sites and ERI Workshops.
- Included in the solution is the platform for external stakeholders to contribute electronically during outages. e.g. OEM etc.
- Closed loop electronic solution from control documents generation, operation, support and back to the signoff of the checksheets. **(Check sheet process flow Ref 4).**
- The system must cater for a controlled change management process when any templates are updated.

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- System must make provision mobile cellular applications compatibility.
- Provision must be made for wireless connection.
- Provision must be made for network on the turbine floor during the trial phase.
- Data security assurance.
- The system must centralize all the checksheet information on the cloud.
- Supply Wi-Fi connectivity during the trial stage.
- The system must be capable of uploading pictures, videos and/or drawings.
- The system must be compatible to be integrate to other Eskom third party IM internally and externally developed systems. (e.g. SAP, Solid works, Bentley asset management, Microsoft systems etc).

2.4 Specific Requirements

- **Cloud Based** – Cloud based solution hosted securely within the boundaries of RSA.
- **Azure Tenant Integration** – Use Azure Tenant infrastructure for authentication and authorization, ensuring that only authorized users can access the system and its features. Seamlessly integrate with the company's existing Azure infrastructure.
- **Notifications/Alerts** – Send prompt notification to the application and send email notifications for task activities, approvals/rejections, and escalations. Enable notifications to be sent directly to team members via email.
- **System Testing** - The vendor's testing team is responsible to acquire the testing requirements, develop the test cases, and conduct testing to ensure that the solution is comprehensively evaluated for implementation in the Eskom IT environment.

The testing staff may not be the same staff as the configuration, development and implementation staff assigned to the Project. The tenderer must make sure skilled adequate resources with an experienced test manager are deployed to test the system

- **Information Security** - The solution shall adhere to stipulated Eskom Information Security requirements which will be shared with the vendors.
- **Mobile Accessibility:** Ensure that the system is accessible on mobile devices for Supervisors; Technicians; Engineers; Quality; OEM and Management teams to update information and access technical data in real-time

3. System Lifecycle

The solution required to advance the need's life cycle should meet the following requirements:

Development time frame.

The period required time for development of the system.

1- 2 Years.

Implementation Plan

The final implementation planed period for rolling out the system.

1-3 years.

Support and Maintenance

The period required for Support & Maintenance.

1-3 years.

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4. Applicable standards

The following standards are applicable but not limited to.

- CISM: Certified Information Security Management
- ISO27001: International Information Security Management
- ISO27005: Information Security Risk Management
- ISO27032: Cyber Security Management

5. SHEQ Reequipments

All service providers are expected to comply with, but not limited to the following during the implementation of the system at all sites:

- 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 Eskom 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.

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- 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 all activity that needs to be performed.
- Ensure the activities are carried out following a Works Instructions and Procedure.
- 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 when working onsite.
- All work carried out by the service provider must meet the minimum SABS and SANS standards.
- Tools and equipment to be stored correctly in a safe place when conducting work on site.

6. Key performance indicators

Objective	Indicator	Measure	Unit of Measure	Source of Evidence
Safety Sustainability	LTI Free days	LTI Free days	Days	To be provided by supplier
Turnaround Time	Available within 24 hours	Number of queries responded to in 24 hours	Each/Day	To be provided by supplier
Due Date Performance	Due Date Performance	Average contracted outage days saved	Days	To be provided by supplier
Reduce the Number of Rework Incidents	No of Rework Incidents	Number of Rework Incidents	Each	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 or Hrs	To be provided by supplier
No of Legal & Environmental Contraventions	No of Legal & Environmental Contraventions	Number of contraventions	Each	To be provided by supplier
Zero Fatalities Excl 3rd party at fault	Zero Fatalities Excl 3rd party at fault	Number of fatalities	Each	To be provided by supplier

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7. Special Notes

1. The solution must have the capability to recover information in disaster situations and must have capability to adapt to future changes on technological trends. The system must be able to work offline when the network is down.
2. Upon completion of the project, the intellectual property shall belong to ERI however, expected maintenance and licensing fee must be clearly stipulated on the quotation.
3. Bidders shall present details of the system functionality; technical ability; cyber security; integration and testing as well as cloud requirements as indicated in the evaluation criteria (***refer to the attached excel file: ERI TGS Technical Engineering Technical Integration System***).
4. Unlimited number of user licenses, however a customized licenses model can be proposed, and it will be considered and evaluated.

8. List of attachments

Item no	Ref	Description
1	Ref 1	Check Sheet Specimen
2	Ref 2	Tablet (Toughbook) Specification
3	Ref 3	List of Power Station
4	Ref 4	Check Sheet Process Flow

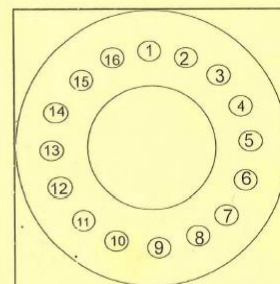
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Boit Number	LP 1 Turbine		LP 2 Turbine		Act Difference		Act Diff - Centre Line	
	Journal	Coupling	Coupling	Journal	Coupling	Journal	Journal	Coupling
1							1 / 9	1 / 9
2							2 / 10	2 / 10
3							3 / 11	3 / 11
4							4 / 12	4 / 12
5							5 / 13	5 / 13
6							6 / 14	6 / 14
7							7 / 15	7 / 15
8							8 / 16	8 / 16
9								
10								
11								
12								
13								
14								
15								
16								
1								

 Remarks: _____


 Maximum Concentricity error between journal centre lines =

(Maximum allowable = 0,01 mm)

 Maximum Concentricity error between coupling centre lines =

(Maximum allowable = 0,015 mm)

	NAME IN BLOCK LETTERS	SIGNATURE	DATE	INSTRUMENT NUMBER
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER				
* VERIFIED BY - CLIENT / 3RD PARTY				

Robust handheld tablet (Tough book) specification

The tablet shall have a minimum of and not limited too.

- Appearance.
 - Screen spec: 10.1" Full High Definition
 - Brightness: 700 Nits
 - Scratch resistant.
 - Support glove touch.
- Resolution: 1200 x 1920
- Performance
 - Windows 11 Pro.
 - RAM: 16GB.
 - ROM: 128GB Storage.
 - Battery spec 1: 5000mAh Removable Li-Polymer Battery.
 - Battery spec 2: 860mAh Built-In RTC Battery.
 - Adapter (input AC 100V~240V 50Hz, output DC 19V/3.42A).
 - Processor: Intel Core i5-1235U.
 - Working Temperature: -20 °C To 60 °C.
 - IP rating: IP65.
 - Biometrics: Fingerprint.
- Camera
 - Rear camera: 8Mp.
 - Front camera: 5Mp.
- Connectivity.
 - Network: 2G/3G/4G<E.
 - Bluetooth: Transmitted distance 10m.
 - NFC: Short range wireless communication.
 - WiFi.
 - GPS.
- Durability
 - Drop certification: MIL-STD-810H.
 - Humidity: 95% non-condensing
- Input/Output (I/O)
 - USB 3.1
 - USB Type-C (Full function/HDMI/Charging).
 - Standard Earphone jack.
 - HDMI 2.1a Mini.
 - Sim/TF Card.
 - 2Pin Pogo Pin (USB/Docking charging)
 - RJ45
 - RS232
 - USB2.0
 - 2D Bar/QR code Scanner
- Inclusions:
 - Stylus pen, docking station, sling, carry handle and shoulder strap.

No	Station Name	Location
1	Matla Power Station	Mpumalanga
2	Lethabo Power Station	Free state
3	Matimba Power Station	Limpopo
4	Duvha Power Station	Mpumalanga
5	Majuba Power Station	Mpumalanga
6	Tutuka Power Station	Mpumalanga
7	Kendal Power station	Mpumalanga
8	Medupi Power Station	Limpopo
9	Kusile Power Station	Mpumalanga
10	Arnot Power Station	Mpumalanga
11	Kriel Power Station	Mpumalanga
12	Camden Power Station	Mpumalanga
13	Hendrina Power Station	Mpumalanga
14	Grootvlei Power Station	Mpumalanga

