Eskom	Report	Engineering

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.....	.....	.....
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1. Introduction

The project entails Substation SCADA Replacement for Kendal Power Station. The switchgear S5 PLCs are used for monitoring, indications, controls and alarms. Each substation is equipped with satellite S5 PLC that collects information from the boards and sends it through to EOD S5 co-ordinator PLC via the redundant H1 communication network. The HV Yard satellite S5 PLC collects information from the HV Yard and sends it through to EOD S5 co-ordinator PLC. The information from the S5 co-ordinator PLC is sent to the COROS System for display and monitoring.

The existing EOD and switchgear S5 PLC are obsolete and the OEM does not offer any technical support to sustain the plant until the Switchgear Replacement project is executed. The E490 modules for time stamping are obsolete. This poses a production risk and makes the plant unreliable as in some instances the switchgear S5 PLCs inadvertently issue commands to open breakers and plant monitoring is not possible due to faulty modules

At Kendal Power Station, the existing EOD and switchgear S5 PLC are obsolete and the OEM does not offer any technical support to sustain the plant until the Switchgear Replacement project is executed. The E490 modules for time stamping are obsolete. This poses a production risk and makes the plant unreliable as in some instances the switchgear S5 PLCs inadvertently issue commands to open breakers and plant monitoring is not possible due to faulty modules.

This specification covers the scope & requirements for the design, procure/manufacture, integrating, testing, supply, delivery to site, erection, commissioning, certification, and handover of the Substation Automation System (SAS)

2. Supporting Clauses

2.1 Scope

This document discusses the different technical aspects that will be evaluated and scored by the Technical Evaluation Team (TET) to complete the technical evaluation for S5 PLC and SCADA Replacement. The team members who will be involved in the evaluation are listed in this document along with their responsibilities. This document also describes the acceptable and unacceptable risks and qualifications and/or conditions that will be applicable to the Scope of Work. Once the Technical Evaluation Strategy is authorised, no changes will be made to the evaluation criteria without the appropriate authorisations.

2.1.1 Purpose

The purpose of this tender technical evaluation strategy is to define the Mandatory Evaluation Criteria, Qualitative Evaluation Criteria and TET member responsibilities for tender technical evaluation. The technical evaluation strategy serves as basis for the tender technical evaluation process.

2.1.2 Applicability

This document is applicable to Kendal Power Station **ONLY** and the project team involved in the Kendal SCADA Replacement Project.

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] ISO 9001 Quality Management Systems

[2] *1024325 User Requirements Specification (URS) for Kendal MV and LV Switchgear Replacement

[3] 474-9857 Kendal Electrical Stakeholder Requirements Analysis Review Report (Rev 2)

[4] 379-KEN-ADDB-D00179-5 Engineering Management Plan for Kendal Switchgear Replacement Project

[5] 379-PRJ-1-BDDD-D00185-12 Kendal Switchgear Replacement Project Concept Design Report (Rev 2)

[6] 240-53113685 Design Review Procedure

[7] 240-53114026 Project Engineering Change Procedure

[8] 240-53459028 Perform Power Plant Electrical Engineering

[9] 240-144177358 Perform Electrical Power System Studies within Gx Plant Work Instruction

[10] 240-70164623 Design Guideline for HVAC in the Eskom Coal Fired Power Stations

[11] 240-56227573 Air-insulated withdrawable AC metal-enclosed switchgear 1kV to 52kV

[12] 240-82332407 Generation Fixed Pattern Gas Insulated Metal-Enclosed Indoor Primary Switchgear and Controlgear Standard

[13] 240-56179027 General Safety Measures - Electrical Arc for Switchgear up to 15kV Standard

[14] 240-143485806 Generation Auxiliary Plant Medium Voltage Protection Standard

[15] 240-56227516 LV Switchgear Control Gear Assembly Associated Equipment for Voltage 1000V AC and 1500V Standard

[16] 240-56227443 Requirements for Control and Power Cables for Power stations Standard

[17] 240-62772907 Specification Standard for Stationary Diesel Generator Systems

[18] 240-56227589 List of Approved Electronic Devices to be Used on Eskom Power Stations Standard

[19] 379-PRJ-1-BDDD-D00186-1 Kendal Switchgear Replacement Project Power System Studies Report

[20] 240-55410927 Cyber Security Standard for Operational Technology

[21] 240-106271076 Sub-Station Control System Commissioning

[22] 240-68234842 Sub-Station Gateway and Station RTU/IED Standard Specification for EHV Sub-Stations

[23] 240-100912715 Secondary Plant ERTU, RTU, Bay Processor and HMI Maintenance Standard Revision

[24] 240-55863502 Definition of Operational Technology (OT) and OT/IT Collaboration Accountabilities

[25] 240-56355910 Management of Plant Software Standard

[26] 32-85 Eskom Information Security Policy

[27] 32-214 Remote Access Procedure

2.2.2 Informative

[28] NWM KEIM 100 Kendal Power Station Information Manual Auxiliary Electrical Power System

[29] 379-PRJ-1-ADDB-D00180-2 Kendal Refurbishment Project Design Manual (PDM)

[30] 474-12267 Heating Ventilation and Air Conditioning (HVAC) Group Technology Strategic Report 2020 (Rev 1)

[31] 240-129014618 Generation Cyber Security Compliance Guideline

[32] 240-129693459 Generation PLCM

2.3 Definitions

2.3.1 Classification

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

2.3.2 Terminology

Definition	Description
IED	Intelligent Electronic device. Generic name given to all microprocessor-based substation secondary devices, e.g. relays and tariff meters.
RS232	An Electronic Industries Association (EIA) standard for the interfacing between Data Communications Equipment (DCE) and Data Terminal Equipment (DTE). It defines the electrical characteristics of the signals from such devices.
RS422	An EIA recommended standard to extend the RS232 50 ft limit to 1 200 m and is electrically compatible with the CCITT V.11 standard.
Substation Control System (SCS)	Defined as an integrated and coordinated system that performs the tasks of Supervisory Control and Data Acquisition (SCADA), substation automation and offers a single point of control and alarm annunciation (Human–Machine Interface (HMI)) to the substation operator.
PLC	A programmable logic controller (PLC) or programmable controller is an industrial computer that has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, machines, robotic devices, or any activity that requires high reliability, ease of programming, and process fault diagnosis
SCADA	Supervisory control and data acquisition (SCADA) is a system of software and hardware elements that allows industrial organizations

Definition	Description
	to: Control industrial processes locally or at remote locations. Monitor, gather, and process real-time data

2.4 Abbreviations

Definition	Description
TET	Technical Evaluation Team
OHS Act	Occupational Health & Safety Act
EOD	Electrical operating desk
FAT	Factory Acceptance Test
Gx	Generation
IEC	International Electro-technical Commission
IED	Intelligent Electronic Device

2.5 Roles and Responsibilities

- **Engineering Manager**: Kendal Engineering Manager shall ensure that the respective areas understand and adhere to Tender Technical Evaluation Procedure
- **Project Manager**: Kendal Project Manager shall ensure that project is co-ordinated correctly and timelines are met.
- **Electrical Engineering and PTM**: Kendal Electrical Engineering and PTM shall ensure that quality work is done and plant labelled according to Eskom Standard.
- **Technical Evaluation Team (TET) Member**: The delegated technical/management team is responsible for review and evaluate technical aspects of the tender documentation.

2.6 Process for Monitoring

The project will follow the Engineering Change Management Procedure, in order to provide an effective process for controlling changes to plant, technical documentation and an agreed baseline. All reviews for the project will follow the Design Review Procedure.

2.7 Related/Supporting Documents

- 240-53716746: Tender Technical Evaluation Report Template
- 240-53716712: Tender Technical Evaluation Results Form Template
- 240-53716726: Tender Technical Evaluation Scoring Form Template
- 240-53716769: Tender Technical Evaluation Strategy Template

3. Tender Technical Evaluation Strategy

3.1 Technical Evaluation Threshold

Mandatory Technical Evaluation Criteria (gatekeepers) are 'must meet' criteria. These criteria shall not be weighted or point scored, but shall be assessed on a Yes/No basis as to whether or not the criteria are met unless set otherwise. An assessment of 'No' against any criterion shall technically disqualify the tenderer and shall not be further evaluated against Qualitative Criteria.

Qualitative Technical Evaluation Criteria are weighted evaluation criteria used to identify the highest technically ranked tenderer after determining that all the Mandatory Evaluation Criteria have been met. The Qualitative Evaluation Criteria are weighted to reflect the relevant importance of each criterion. The minimum weighted final score (threshold) required for a tender to be considered from a technical perspective is **80%**.

3.2 TET Members

Table 1 below lists the TET members

Table 1: TET Members

TET number	TET Member Name	Designation
TET 1	Nathi Mkhize	Kendal Electrical Engineer
TET 2	Msizi Zulu	Kendal Electrical Engineer
TET 3	Ntobeko Mthembu	Kendal Electrical Engineer
TET 4	Msingathi Tose	Kendal Electrical Engineer
TET 5	Lungisani Maseko	Kendal PTM Advisor
TET 6	Phila sande Zwane	Kendal Electrical Engineer

3.3 Mandatory Technical Evaluation Strategy

Table 2: Mandatory Technical Evaluation Strategy

	Mandatory Technical Criteria Description	Reference to Technical Specification / Tender Returnable	Motivation for use of Criteria
1.	Proof of Registration as an Electrical Contractor with Department of Labour. **Please submit a Certified Under Oath Copy Certificate.**	Tender Returnable	Checking if the Contractor is an Electrical Contractor and Certificate is certified as requested

3.4 Qualitative Technical Evaluation Criteria

Table 3: Qualitative Technical Evaluation Criteria

Note: *Minimum threshold is **80%**.*

	Qualitative Technical Criteria Description		Reference to Technical Specification / Tender Returnable	Criteria Weighting (%)	Criteria Sub Weighting (%)
1.	**Ability to Execute**				**35**
	1.1	Provide design philosophy for the SCADA Replacement. • No reference to or provision of design philosophy in the proposal – 0% • Provision of 40% design philosophy requirements in the proposal. – 2% • Provision of 80% design philosophy requirements in the proposal – 4% • Provision of 100% design philosophy requirements in the proposal – 5%	Tender Returnable		5
	1.2	Provide basic operating philosophy for the SCADA Replacement. • No reference to or provision of operating philosophy in the proposal – 0% • Provision of 40% operating philosophy requirements in the proposal. – 2% • Provision of 80% operating philosophy requirements in the proposal – 4% • Provision of 100% operating philosophy requirements in the proposal – 5%	Tender Returnable		5
	1.3	Provide maintenance philosophy for the SCADA Replacement.	Tender Returnable		5

		• No reference to or provision of maintenance philosophy in the proposal – 0% • Provision of 40% maintenance philosophy requirements in the proposal. – 2% • Provision of 80% maintenance philosophy requirements in the proposal – 4% • Provision of 100% maintenance philosophy requirements in the proposal – 5%			
	1.4	Provide high-level concept drawings for the SCADA Replacement. • No reference to or provision of concept drawings in the proposal – 0% • Provision of 40% concept drawings requirements in the proposal. – 2% • Provision of 80% concept drawings requirements in the proposal – 4% • Provision of 100% concept drawings requirements in the proposal – 5%	Tender Returnable		5
	1.5	Provide datasheets for your concept design drawings • No reference to or provision of datasheets for concept design drawings in the proposal – 0% • Provision of 40% datasheets for concept design drawings requirements in the proposal. – 2% • Provision of 80% datasheets for concept design drawings requirements in the proposal – 4% • Provision of 100% datasheets for concept design drawings requirements in the proposal – 5%	Tender Returnable		5
	1.6	Tenderers shall provide a list of previous work related to the installation of RTU and SCADA Replacement, along with references from national customers, with	Tender Returnable		5

		supporting letter/s that includes the contract numbers / order numbers, with durations and verifiable references: • Less than 2 years' Experience – 0 % • Between 3 to 5 years' Experience – 3.5 % • More than 5 years' Experience – 5 %			
	1.7	Provide company profile, it must show that the company have worked on PLC, RTU and SCADA. • Company profile does not show they have worked on PLC or RTU or SCADA – 0% • Contractor have worked on PLCs and SCADA – 3% • Contractor have worked on RTUs and SCADA – 4% • Company profile shows they have worked on PLC, RTU and SCADA – 5%	Tender Returnable		5
2.	**Accreditation**				**65**
	2.1	The team provided to perform this activity must: • Tenderers shall provide ECSA registered Engineer to sign off the detail designs, testing procedures, commissioning procedures and certification documentation, during site execution and handover of the complete *Works* o Submit CV showing experience on PLCs, RTUs and SCADA with references – 3% o Certified Degree Certificate – 1.5 % o Certified ECSA Certificate – 1.5% • Two Electrical technician with Diploma in Electrical Engineering, and 5 or more years	Tender Returnable		16

		of experience. Please provide certificate as proof of qualification and CV. o First Person ▪ CV (Experience Indicated) - 1% ▪ Qualification Certificate – 2% ▪ MIE Certificate – 2% o Second Person ▪ CV (Experience Indicated) - 1% ▪ Qualification Certificate – 2% ▪ MIE Certificate – 2%			
	2.2	The workshop manager provided to oversee the execution of these services has to provide proof of proficiency in supervision, safety awareness and technical ability (certificates). • CV of a workshop manager indicating relevant experience in supervision o No relevant experience provided – 0% o CV of a Workshop Manager indicating relevant experience between 2 - 4 years – 2% o CV of a Workshop Manager indicating relevant experience between 5 - 7 years – 5% • Safety Awareness Certificate – 5% • Technical Qualification Certificate (National Diploma or Degree) – 5%	Tender Returnable		15
	2.3	Tenderers shall provide evidence of facilities within the Republic of South Africa, including any workshops, warehouse storage and test equipment. Technical	Tender Returnable		18

		Evaluation team will verify the workshop and testing equipment in the contractor's yard. Contractors must provide its own workshop, not a workshop for another company • Workshop in South Africa without proper equipment to build and test panels – 0% • Workshop not in South Africa – 0% • Workshop in South Africa with proper equipment to build and test panels – 8% Develop a functional SCADA system of variable speed drive with a small AC motor, it must be able start, stop via SCADA, and monitor it all the time. This part must be witness by the Technical Evaluation Team (TET) members on the premises of the contractors • No reference to or provision of scope compliance in the proposal – 0% • Provision of 40 % of scope compliance requirements in the proposal – 4% • Provision of 80 % of scope compliance requirements in the proposal – 8% • Provision of 100 % of scope compliance requirements in the proposal – 10%			
	2.4	Tenderers must submit a method statement for the works clearly demonstrating compliance with the full scope of work. • No reference to or provision of scope compliance in the proposal – 0% • Provision of 40 % of scope compliance requirements in the proposal – 2%	Tender Returnable		6

		• Provision of 80 % of scope compliance requirements in the proposal – 4% • Provision of 100 % of scope compliance requirements in the proposal – 5% The contractor shall ensure that all test sheets/quality control plans for the Switchgear Interface, IEDs/RTU and SCADA are developed and supplied as part of evaluation. • RTU and SCADA test sheets – 1%			
	2.5	The contractor must ensure that all drawing are drawn in MicroStation V8, not converted to MicroStation V8. The proof must be provided that they have software in writing If this activity will be out sourced, the proof of agreement between the two parties in a form of a letter must be provided. Both parties must sign the agreement. • Proof not provided of having MicroStation V8 – 0% • Proof provided that the contractor have MicroStation V8 – 10%	Tender Returnable		10
					TOTAL: 100

Table 4: TET Member Responsibilities

Mandatory	TET 1	TET 2	TET 3	TET 4	TET 5	TET 6	TET 7
1	X	X	X	X	X	X	X
Ability to Execute							
1							
1.1	X	X	X	X	X	X	X
1.2	X	X	X	X	X	X	X
1.3	X	X	X	X	X	X	X
1.4	X	X	X	X	X	X	X
1.5	X	X	X	X	X	X	X
1.6	X	X	X	X	X	X	X
1.7	X	X	X	X	X	X	X
Accreditation							
2							
2.1	X	X	X	X	X	X	X
2.2	X	X	X	X	X	X	X
2.3	X	X	X	X	X	X	X
2.4	X	X	X	X	X	X	X
2.5	X	X	X	X	X	X	X

5. Authorisation

This document has been seen and accepted by:

Name & Surname	Designation
Remember Sigawuke	Kendal Electrical Engineering Manager
Nonhlanhla Khumalo	Kendal Acting Engineering Manager
Msingathi Tose	Kendal Electrical Engineer
Mooiman Phetla	Kendal Electrical Engineer
Ayanda Mahlobo	Kendal Electrical Engineer
Philasande Zwane	Kendal Electrical Engineer
Thumeka Mbatha	Kendal Electrical Engineer
Nokukhanya Khathi	Kendal Electrical Engineer
Dayalan Govender	Kendal Electrical Senior Engineer

6. Revisions

Date	Rev.	Compiler	Remarks
June 2022	0	N Mkhize	Final document for signature

7. Development Team

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

- Nathi Mkhize
- Thumeka Mbatha

8. Acknowledgements

N/A