KENYA ELECTRICITY GENERATING COMPANY PLC

KGN-ICT-006-2025
TENDER FOR SUPPLY AND INSTALLATION OF DATA ANALYTICS, REPORTING AND BACKUP APPLIANCE.
Rfx 5000016475
(OPEN NATIONAL)

Date: 28th March, 2025

CLARIFICATION NO.1

In accordance with the **'Tender for Supply and Installation of Data Analytics, Reporting and Backup Appliance'**, KenGen hereby issues **Clarification No. 1** as follows:

1. NOTICE OF ADDITIONAL SITE VISITS

Item	Clarifications	KenGen's Response
	What is the scope of the project? Tender mentioned four plants …for the bidders to budget and quote.	**Geothermal**-Olkaria IAU, II, IV,V **Eastern Region**-Masinga, Kamburu, Gitaru, Kindaruma, Kiambere, Tana, Wanjii, Turkwel **Western Region**-Sangoro, Sondu, Muhoroni **Thermal**-Kipevu III. **Ngong wind farm**-Gamesa & Vestas
	Number of Power Plants that are included in the scope of this project.	
	What backup solution do you have currently?	This scope was dropped, refer to ***Addendum 2.***
	What is the current business intelligence tool?	None, but power BI is being used for visualization on small scale.
2.	We need the ICSS (Integrated Control System) Architecture for each Power Plant with the details of installed control system like Honeywell Experion Version 520 & the details of Data historian Installed like Honeywell PHD or Exa quantum.	The information is shared in table 1 of this clarification document.
3	Estimate Number of Tags (AI & DI) for each Plant.	Approximate 1000 tags per plant with (**70% AI & 30% DI**)
4.	Estimate Number of PID/Control Loops	This is not applicable
5.	Details of Installed Systems like GIS, Seismic and Automatic Meter Reading system.	Seismic Server-Linus ubuntu, Data is in seed format. Automatic Meter Infrastructure- runs on SQL database. (ModEm, Siesmic, GNSS – Data is in form of Binary sets

		Petrel – SQL 14 Logplot – Binary data set)
6.	Details of Installed IOT system like Brand and Version and the current use	Yokogawa, Exa quantum Version 3.20
7.	Details of Installed ERP system like SAP S4 HANA	ERP – ECC 6.0 EHP8 & 2.0 SAP HANA Database
8.	Is there any active Microsoft Azure Cloud Subscription or Office 365 in place at corporate or Plant Level?	Yes
9	What is the current Business Intelligence Tool being used by KenGen?	Basic power BI
i).	**Data Sources & System Architecture** Can you provide a breakdown of the data sources available at each site (Thermal, Eastern, Geothermal, and Western Regions) and their data types?	Some data sources to consider: i. SCADA/DCS systems: real-time operational data (temperatures, pressures, flow rates, etc.). ii. PLC/RTU: Control systems data. iii. Historian Servers: Time-Series process data (e.g., Exaquantum, Canary). iv. IoT Sensors: Vibration, Temperature, Gas levels etc. v. Maintenance logs: SAP ERP Plant Maintenance system. vi. Fuel management systems vii. Weather data: Wet bulb temperature – (temperature, humidity, atmospheric pressure) etc. viii. Energy billing and load demand data etc.
ii).	What types of data are generated and stored in each system (e.g., operational, sensor data, transactional, historical logs)?	Power generation operational data:e.g. ▪ Electrical Data: Power output (MW), voltage, current, frequency, power factor etc. ▪ Mechanical Data: Turbine speed (RPM), generator temperature, vibration levels etc. ▪ Thermal Data: Steam pressure, steam temperature, condenser temperature etc. ▪ Fuel Data: Fuel flow rate, fuel type, fuel consumption etc. ▪ Environmental Data: Emissions (CO_2, H2S), ambient temperature, humidity etc. ▪ Operational Status: Equipment status (ON/OFF), alarms, trips, maintenance logs etc. ▪ Efficiency Metrics: Heat rate, load factor, capacity factor etc.

iii).	Do all locations operate on a unified system, or are they using separate systems that feed into a central database?	Depends on the Region. Some have separate systems
iv).	If separate, what are the integration points or mechanisms currently in place for data consolidation?	This project shall bring all data into a centralized data lake.
i).	**Clarification on Additional Site Visits & Implementation Phases** The original document outlined four site visits, seemingly aligning with four implementation phases. With the inclusion of three additional locations in the addendum, does this indicate additional implementation phases?	The project shall be executed as a single phase and will cover the following scope: ▪ Data Acquisition and Ingestion ▪ Data Lake Implementation ▪ Data Warehouse Development ▪ Systems Integration ▪ Advanced Analytics ▪ Data Mining and Business Intelligence ▪ Data Visualization and Reporting ▪ Capacity building/Training The Data Sources are not limited to: **Geothermal Region Systems**-Olkaria IAU, II, IV, V, Geoscientific and drilling systems-Geophysics, Geochemistry, Geology,GIS etc. **Eastern Region Systems**-Masinga, Kamburu, Gitaru, Kindaruma, Kiambere, Tana, Wanjii, Turkwel **Western Region Systems**-Sangoro, Sondu, Muhoroni **Thermal Systems**-Kipevu III. **Ngong wind farm Systems -**Gamesa and Vestas systems Enterprise Systems-SAP ERP, Flat Files, other relevant Documents/Systems etc.
ii).	Will the scope of work be expanded to accommodate these additional locations, or will they be integrated into the existing phases?	The project shall be executed as a single phase
iii).	How will the project timeline and deliverables be adjusted to account for the newly added sites?	The project delivery is one Year. Delivery Period is 6 months. Contract valid for 2 Years.
i).	**Reporting Requirements & Data Warehouse Scope:** What specific reports are expected from the proposed data warehouse?	The reports expected are not limited to: • Financial • Operational • Inventory • Procurement • HR • Accounting. Etc.
ii).	While we anticipate reports from power systems, will SAP ERP systems also require reporting functionalities?	Yes
iii).	What are the minimum reporting	The scope includes data analytics, visualization,

	requirements that should be covered in our scope?	reporting. Further metrics will be shared during implementation
iv).	Are there any compliance or regulatory reporting obligations that must be met?	Compliance or regulatory reporting obligations include but not limited to: i). Data Protection Laws (e.g., Data Protection Acts) ii). Internal Company Policies and Procedures iii). Cybersecurity Regulations and Frameworks iv). IT and Operational Systems Compliance v). Industry Standards and Best Practices
v).	Are there any reporting samples that can be provided?	Reporting samples shall be provided during implementation
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i).	**Role of Windows Server & SAP Data Sources:** How does the Windows Server fit into the data architecture?	This depends on the solution deployed. KenGen PLC provides the platform for the bidders to enhance their scope and provide flexibility on the solution to be offered by the vendors.
ii).	Which specific data sources from SAP and Windows Server will be integrated into the data warehouse?	The databases KenGen PLC in collaboration with successful bidder will identify the databases to be incorporated.
iii).	What type of data will be extracted from SAP (e.g., financial, operational, inventory, procurement, HR, accounting)?	The system to be agile enough to accommodate any data/reports required from time to time. This can be from: i). Financial ii). Operational iii). Inventory iv). Procurement v). HR vi). Accounting vii). Billing. Etc.

DCS/SCADA Systems Summary – Table 1

Region	Vendor	Version	HMI	Database for Historian
Masinga	Schneider	MODICOM M850	PcVUE by Arc Informatique	XIOM by Canary Labs
Kamburu	Schneider	MODICOM M850	PcVUE by Arc Informatique	XIOM by Canary Labs
Gitaru	Schneider	MODICOM M580	PcVUE by Arc Informatique	XIOM by Canary Labs
Kindaruma	Schneider	MODICOM M580	PcVUE by Arc Informatique	XIOM by Canary Labs
Kiambere	Schneider	MODICOM M580	PcVUE by Arc Informatique	XIOM by Canary Labs

Region	Vendor	Version	HMI	Database for Historian
Turkwel	Schneider	MODICOM M580	PcVUE by Arc Informatique	XIOM by Canary Labs
Sangoro	Schneider	MODICOM M850	PcVUE by Arc Informatique	None but All analogs archived within the SCADA System.
Tana	Siemens	SIMATIC S7	PcVUE by Arc Informatique	PI OSI soft-Not functional but None but All analogs archived within the SCADA System.
Wanjii	Siemens	SIMATIC S7	Hycon 300 by Voith	None but All analogs archived within the SCADA System.
Sondu	Toshiba	Intouch 8.0 Wonderware	Intouch 8.0 Wonderware	Operating station no database
MESCO	Allen Bradley	L32E	Redlion	PcVUE by Arc Informatique
Olkaria IAU 4&5	Honeywell	Honeywell C300	Experion Process Knowledge System (PKS) 520	Plant Information Management System (Exaquantum) by Yokogawa
Olkaria IAU 6	Honeywell	Honeywell C300	Experion Process Knowledge System (PKS) 510	Plant Information Management System (Exaquantum) by Yokogawa
Olkaria II	Mitsubishi	DIASYS Netmation 2.054	Diasys Netmation	Plant Information Management System (Exaquantum) by Yokogawa
Olkaria IV	Honeywell	Honeywell C300	Experion Process Knowledge System (PKS) 520	Plant Information Management System (Exaquantum) by Yokogawa
Olkaria V	Honeywell	Honeywell C300	Experion Process Knowledge System (PKS) 500	Plant Information Management System (Exaquantum) by Yokogawa
Ngong	Gamesa	WindNet R1	SQLSERVER2008R2 SQL Server 10.50.2500	None but Using SQLSERVER2008R2 SQL Server 10.50.2500 (Database)
Ngong	Vestas	Vestas Online Business Version 3.10.1	SQL Server 2005 Services	None but Using SQL Server 2005 Services (Database)
Kipevu III	COPA DATA	Zenon Energy Edition Version	COPA DATA, Zenon	COPA DATA, Zenon Historian

Region	Vendor	Version	HMI	Database for Historian
		14		Version 14
Muhoroni	Allen Bradley	Allen Bradley Logix 5572	Rockwell Automation FactoryTalk View Point v10.00.00 SE Station Software	None but All analogs archived within the DCS/SCADA System.

BIDDER'S ACKNOWLEDGEMENT OF CLARIFICATION NO.1

We, the undersigned hereby certify that the Clarification is an integral part of the tender document and the alterations set out in addendum has been incorporated in the tender Proposal.

Signed …….

Bidder …….

Date …….