

ABOUT KENGEN

Kenya Electricity Generating Company (KenGen) is a limited liability company, whose core business is power generation. KenGen is the leading electric power producer in Kenya accounting for over 80% of the total electric power consumed in the country.

VISION STATEMENT

To be market leader in the provision of reliable, safe, quality and competitively priced electric energy in the Eastern Africa region.

MISSION STATEMENT

To efficiently generate competitively priced electric energy using state-of-the-art technology, and skilled and motivated human resource to ensure financial success. We shall achieve market leadership by undertaking least cost, environmentally friendly capacity expansion. Consistent with our corporate culture, our core values will be adhered to in all our operations.

CORE VALUES

- Integrity
- Profession
- Qualified/Trained staff
- Skills and Motivation
- Team Spirit
- Safety Culture

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1.0 GENERAL OVERVIEW

KenGen has the following types of Electrical Equipment installed in its power generation installations whose maintenance (preventive and breakdown) is solely undertaken by the Technical Services staff

- (i) Generators - Largest installed unit is 100MVA
- (ii) Transformers - Largest installed unit is 100MVA
- (iii) Switchgear - These range from Vacuum, SF6 and MOCBs.

1.1 Calibration and Test Equipment

KenGen has the following major test equipment, which is used for maintenance, and commissioning work. The equipment is duly calibrated by an accredited facility.

- (i) Primary & Secondary injection sets
- (ii) CBT 400 (Circuit Breaker Timing Equipment)
- (iii) Capacitance and Dissipation factor Test Set (Tan D)
- (iv) Transformer Turns Ratio (TTR)
- (v) Thermograph Camera
- (vi) Oil Regeneration and Filtration Plant (Fluidex)
- (vii) Dissolved Gas Analyser

1.2 Staff

Technical Services has professionals who are well trained and highly experienced in the field of maintenance and commissioning of electrical equipment. The category of staff includes Engineers, Technicians, and Craftsmen

1.3 Major jobs Undertaken

Technical Services has undertaken a number of challenging projects within KenGen installations such as:

- (i) Installation & Commissioning of 100MVA transformer

- (ii) Rewinding of 23.5MVA Generators
- (iii) Upgrading of Excitation, Governor and Protection systems
- (iv) Upgrading of Plant Control, Installation & Commissioning of SCADA system.

1.4 Business Venture

As illustrated in the overview above, KenGen has the capacity in terms of equipment, staff and experience in undertaking any Electrical assignment in various Electrical fields. Apart from maintenance, Technical Services has undertaken a number of performance enhancement projects to be in line with the latest technologies in the field.

In view of the above, KenGen would like to venture and offer its services to the market. The rates for its services are competitively priced and the customer is assured of very quality service based on the Company's stringent Quality Management System (ISO 9001:2000).

The scope of the services on offer are spelt out in this brochure.

2.0 ROUTINE MAINTENANCE

(a) Objective

To undertake timely maintenance of equipment so as to avoid downtimes associated with breakdowns and prolong the effective life of the equipment.

(b) Scope of Maintenance

- (i) Motors and Generators
 - Initial Checks
 - Dismantle
 - Associated Control and Protection system checks
 - Cleaning, Drying, Varnishing & Painting

- Assembly
 - Final Checks and commissioning
 - Test Reports
- (ii) Transformers (On-Site)
- Initial Checks
 - Calibration
 - Associated Control and Protection system checks
 - Cleaning & Painting
 - Final Checks and commissioning
 - Test Reports
- (iii) Switchgear (On-Site)
- Inspections
 - Dismantling & Initial Checks
 - Cleaning
 - Breaker Open-Close Operational Checks
 - Functional Checks and Commissioning
 - Test Reports
- (iv) Insulation Oil Tests
- Moisture, Dielectric & Acidity
 - Dissolved Gas Analysis (DGA)

3.0 BREAKDOWN MAINTENANCE

(a) Objective

To restore the equipment back to service as quickly as possible and in the most cost effective manner so as to minimize losses associated with downtimes and advise appropriately with a view to avoiding recurrence.

(b) Scope of Maintenance

The actual scope of work shall depend on the nature and circumstances of the problem. Generally, the scope shall comprise the following:

- (i) Motors and Generators
- (ii) Transformers
- (iii) Switchgear

4.0 CONTROLS AND PROTECTION

(a) Objective

To test and maintain the control and protection systems associated with Generators, Motors, Transformers and or Switchgear so as to confirm continuing operational integrity and enhance reliability of these systems.

(b) Scope of Maintenance

Testing and maintenance of control and protection systems shall comprise the following:

- Motor Controls and Protection Systems
- Generator Controls and Protection Systems
- Transformer Controls and Protection Systems
- Generator Excitation Systems
- Engine/Turbine Control and Protection Systems

5.0 COMMISSIONING

Commissioning services for newly installed and re-commissioning of refurbished/upgraded equipments in the following Areas:-

- Plant control (Relay and PLC logic)
- System Protection (Generator/motors/transformers)
- Instrumentation
- Switchgear
- Transformers
- Generators

6.0 CONSULTANCY

(a) Objective

To offer prompt electrical equipment maintenance services on contract basis to assure sustained operational integrity of the equipments. The service contract shall be mutually agreed upon between KenGen and the customer. The contract shall detail the conditions, exclusions and terms of payment.

To offer consultancy services in major power utility project undertakings. KenGen shall provide the required expertise under agreed terms of contract and assure the client of quality project achievements.

7.0 TRAINING

(a) Objective

To offer relevant technical training to the customers personnel in order to enhance their skills and knowledge with a view to enabling them undertake competent operation and maintenance of their electrical equipments.

(b) Course Titles

- Generators, Transformers, Motors and Switchgear maintenance
- Battery Maintenance
- Insulation Oil
- Generator, Transformer and Motor Winding Tests
- Switching and Isolations Authorization
- Condition Monitoring
- Controls and Protection Systems
- Interpretation of Electrical, Mechanical, Hydraulic Drawings

(c) Scope of Training

- (i) Generators, Transformers, Motors and Switchgear maintenance
 - Principles of Plant/Equipment Operation
 - Definition of Commonly Used Terms
 - Safety Awareness and Requirements
 - Daily, Weekly, Monthly, Quarterly and Annual Checks wherever applicable
 - Importance of Data Capture and Maintenance of Records
 - Interpretation of Operational Data
 - Preventive and Corrective Maintenance
- (ii) Battery Maintenance
 - Principle of Operation
 - Definition of Commonly Used Terms
 - Types of Batteries and Applications
 - Battery Ratings
 - Safety Awareness and Requirements
 - Daily, Monthly and Annual Checks
 - Importance of Data Capture and Maintenance of Records
 - Interpretation of Test Data

(iii) Insulation Oil

- Properties, Applications
- Recommended Tests and Data Interpretation
- Storage and Disposal

(iv) Generator, Transformer and Motor Tests

- Generator and Motor: Winding Insulation Resistance, Dissipation Factor, DC Resistance, Noise, Vibration, Magnetic Center Balance, Wedge Tightness and ELCID Test.
- Transformer: Winding Insulation Resistance, Dissipation Factor, Turns Ratio, Percentage Impedance, Magnetizing Current, Magnetic Balance, Bushing Capacitance, Bushing Dissipation Factor and Noise.

(v) Switching, Isolations and Industrial Safety

- Duties and Responsibilities
- Voltage Definitions
- Terms and Definitions
- Operations
- Permits
- Warning Notices
- Testing and Earthing
- Clearances
- Communication
- Objections
- Classes of Authorization
- First Aid

(vi) Machinery Vibration Monitoring and Analysis

- Vibration Monitoring
- Noise

(vii) Controls and Protection Systems

- Terms and Definitions (Contactors, Relays, Normally-Open, Normally-Closed, Relay Picking and Drop-off, Fail-Safe, Solenoid, Valves, etc.)

- Selections (Automatic, Manual, Remote, Local, Step-By-Step)
- Relay and PLC Logic
- Engine/Turbine Controls (Governor), Generator Controls (AVR)
- Protection Fundamentals (Need for Protection of Power Plants and Equipments)
- Characteristics of Protection Systems (Selectivity, Sensitivity, Reliability and Dependability)
- Protection Systems and Schemes
- Protection Co-ordination (Co-ordination between overload devices and short-circuit fuse protection)

(viii) Electrical, Mechanical, Hydraulic, and Pneumatic Drawings

- Electrical Single-Line Diagrams
- Mechanical Assembly Drawings
- Electrical Control and Schematic Drawings
- Hydraulic and Pneumatic Drawing

(ix) Infra Red Thermograph

8.0 DETAILS OF CONTACT PERSON

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