Kenya Power

The Kenya Power & Lighting Co. Ltd.
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Our Ref: *KP1/9AA-3/PT/22/14-15/dn* 12th November, 2014

M/s ----------

RE: ADDENDUM NO. 1 TO THE TENDER NO. KP1/9AA-3/PT/22/14-15 FOR SUPPLY OF ISOLATING AND DISTRIBUTION TRANSFOMERS

Please refer to the above Tender.

We make the following clarifications and amendments to the Principal Tender Document *(hereinafter abbreviated as the PTD)* for the Supply of Isolating and Distribution Transformers dated October, 2014.

1. **RELATIONSHIP WITH THE PRINCIPAL TENDER DOCUMENT**

Save where expressly amended by the terms of this Addendum, the PTD shall continue to be in full force and effect. The provisions of this Addendum shall be deemed to have been incorporated in and shall be read and construed as part of the PTD.

2. **CLARIFICATIONS HAVE BEEN SOUGHT AS FOLLOWS:**

FOR THE SPECIFICATION REF NO: KP1/3CB/10/049 DATED 2014-09-04 (RATINGS 200KVA & 400KVA):

Question 1:
Clause No. 4.4.4:
As per clause 4.4.4. The HV & LV windings shall be separated so as to allow for cooling and ease of repair.
In case of rectangular coils, HV winding is wound over LV and it is separated by providing cooling ducts and can be repairable easily.

Answer:
Proposed design is also accepted as it provides cooling ducts and facilitates repair.

Question 2:

KPLC Clause no 4.8.3.

As per clause No.4.8.3, Minimum external air clearance (with terminal clamps fitted) shall be as shown under;

Nominal System Voltage Between Phases		**11kV**	**19.1 kV**	**33 kV**
Minimum Clearance between Phase To Earth and phase to neutral	mm	200	270	400
Minimum Clearance Phase to phase between Phases of the same winding	mm	200	270	400
Minimum clearance between a line terminal Of the high voltage winding and a line terminal Of a lower voltage winding	mm	200	270	400
Minimum Creepage Distance	mm	300	520	900

Please confirm that the above clearances are inclusive of the altitude correction factor.

Answer:

Confirmed

Question 3:

KPLC Clause no 5.3.1

As per Clause No 5.3.1, Routine test: Test on top charger

We understand that test on top changer means, the mechanical operation test. Please confirm.

Answer:

Confirmed

Question 4:

KPLC Clause no 4.15.2.

As per Clause No.4.15.2, The fixing arrangement for surge arresters shall be universal type to accept range of surge arresters and shall be subjected to approval of KPLC before manufacture.

Please provide us the drawing of surge arrester in order to provide the fixing brackets as per your requirement.

Answer:

The arresters are to IEC 60099-4 Standard.

Question 5:

KPLC Clause no 4.3.1

As per No. 4.3.1

SWER derived from 33kv 50HZ system

33000/19100V: 200 & 400 kVA

SWER derived from 11kV 50HZ system

11000/19100V: 200 & 400 kVA

Kindly confirm whether these are SWER transformers or isolation transformers. The voltages specified seem to be like isolation transformer. Please confirm

Answer:

The transformers are isolation transformers for SWER system.

Question 6:

KPLC Clause no 4.9

As per Clause No. 4.9, Impulse level for 33kV is:

Nominal system Voltage (kV, rms)	Highest Voltage equipment (kV, rms	Full Wave Lighting Impulse Withstand Voltage Positive (kV, peak)	Chopped Wave Lighting Impulse Withstand Voltage (kV, Peak)	Power Frequency Withstand Voltage (kV, rms)
33	36	200	200	70

Please allow us to proceed with the following values which are sufficient.

Nominal system Voltage (kV, rms)	Highest Voltage equipment (kV, rms	Full Wave Lighting Impulse Withstand Voltage Positive (kV, peak)	Chopped Wave Lighting Impulse Withstand Voltage (kV, Peak)	Power Frequency Withstand Voltage (kV, rms)
33	36	170	187	70

Answer:

Please provide as per the specification

Question 7:

KPLC Clause no 4.14.3

As per clause No4.14.3 The oil shall be new, unused and shall comply with all the requirements of IEC 60296 (class 1: un-inhibited oil) and as per KPLC specification no. KP1/3CB/08/001 Issue 2 Revision 0 dated 2014-04-28

Please provide the mentioned specification **KP1/3CB/08/001 Issue 2 Rev dated 2014-04-28**

Answer:

The Specification has been provided and is hereby attached.

FOR THE SPECIFICATION REF NO: KP1/3CB/10/048 DATED 2014-09-04 (RATINGS 5, 10, 16 & 25 KVA):

Question 1:

KPLC Clause no 4.4.4

As per Clause No 4.4.4, The HV & LV winding shall be separated so as to allow for cooling and ease of repair.

In case of rectangular coils, HV winding is wound over LV and it is separated by providing cooling ducts and can be repairable easily. Please confirm

Answer:

Proposed design is also accepted as it provides cooling ducts and facilitates repair.

Question 2:

KPLC Clause no 4.9.10.3

As per Clause No.4.9.10.3. Minimum external air clearances (with terminal clamps fitted) shall be as shown in under.

Nominal System Voltage Between Phases		**LV**	**19.1 KV**
Minimum Clearance between phase to To Earth and phase to Neutral	mm	80	270
Minimum Clearance Phase to Phase between phases of the same winding	mm	80	270
Minimum Clearance between phase to phase Between phases of the same winding and a line Terminal of a lower voltage winding	mm	N/A	270
Minimum Creepage distance	mm	60	520

Please confirm that the above clearances are inclusive of the altitude correction factor.

Answer:

Confirmed.

Question 3:

KPLC Clause no 5.3.1

As per Clause No 5.3.1. Routine test: Test on Tap changer

We understand that test on tap changer means, the mechanical operation test. Please confirm

Answer:

Confirmed.

Question 4:

KPLC Clause no 4.15.2

As per Clause No 4.15.2, the fixing arrangement for surge transfers shall be universal type to accept range of surge arresters and shall be subjected of KPLC before manufacture.

Please provide us the drawing of surge arrester in order to provide the fixing brackets as per your requirement.

Answer:

The surge arresters are to IEC 60099-4 Standard.

Question 5:

KPLC Clause no 4.14.3

As per Clause No 4.14.3 the oil shall be new, unused and shall comply with all the requirements of IEC 60296 (CLASS 1: inhibited oil) and as per KPLC specification no. KP1/3CB/08/001 Issue 2 Rev 0 2014-04-28

Please provide the mentioned specification KP1/3CB/08/001 Issue 2 Rev 0 dated 2014-04-28

Answer:

The Specification has been provided and is hereby attached.

Question 6:

Clause 5 - TESTS AND INSPACTIONS

Clause 5.2:

".....Type Test Reports for a transformer of identical or higher voltage and kVA rating and within the range from 11/191kV to 36/19.1kV AND 50kVA-500kVA shall be accepted as representative for any of the pole mounted single phase distribution transformer on tender. The type test reports shall be for a transformer of the same design and construction as the transformer being offered."

We have Type test reports for 3-Phase transformers covering capacity range from 50-1500k**VA** and voltage rating of 11kV/LT and 33kV/LT. Other than these, we have short circuit test report for 2000kVA, 33/11kV transformer. Please clarify whether these available type test reports for 3-Phase transformers will cover the KPLC requirement for Isolation transformers, 33/19.1kV and 11/19.1kV for SWER system.

Answer:

Type Test Reports for 33/11kV Single Phase or Three Phase transformers of ratings up to 2500KVA shall also be accepted as being representative of the Isolation & Distribution Transformers on tender. Transformers of ratings of 25 - 2500KVA belong to the same category as per IEC 60076-5.

Question 7:

Is it acceptable to participate in this tender with reference to the ANSI standards and which will deviate from the IEC standards?

Answer:

The specific ANSI Standards have not been stated.
In addition, please note that KPLC's is a 50Hz system not 60Hz. Any offers should therefore be to IEC 60076 (in terms of design and tests).

CHANGE OF CLOSING DATE

The closing date has been changed from **13th November, 2014 to 27th November, 2014 at 10.00am.**

All other terms and conditions remain as per the Principal Tender Document (PTD).

Yours faithfully,

FOR: THE KENYA POWER & LIGHTING COMPANY LIMITED

Eng. JOHN OMBUI
GENERAL MANAGER SUPPLY CHAIN

TABLE OF CONTENTS

0.1 Circulation List

COPY NO.	COPY HOLDER
1	Research & Development Manager
2	Supply Chain Manager (Procurement)
Electronic copy (pdf) on Kenya Power server (http://172.16.1.40/dms/browse.php?fFolderId=23)	

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2014-04-28	Cancels and replaces issue No. 1 dated 2009-05-18	Michael Apudo	George Owuor

FOREWORD

This specification has been prepared by the Research and Development and Technical Services Departments both of The Kenya Power and Lighting Company Limited (abbreviated as KPLC) and it lays down requirements for Mineral Insulating Oil (Transformer & Switchgear Oil). It is intended for use by KPLC in purchasing the oil.

The manufacturer shall submit information which confirms satisfactory service experience with products which fall within the scope of this specification.

1. SCOPE

This specification is for new, unused mineral insulating oil intended for use in transformers, switchgear and similar electrical equipment in which oil is required as an insulant and for heat transfer.

The specification stipulates the minimum requirements for mineral insulating oil acceptable for use in the company and it shall be the responsibility of the manufacturer to ensure adequacy of the design, good workmanship and good engineering practice in the manufacture of the oil for KPLC.

The specification also covers inspection and test of the oil as well as schedule of Guaranteed Technical Particulars to be filled, signed by the manufacturer and submitted for tender evaluation.

The specification does not purport to include all the necessary provisions of a contract.

NOTE: *Mineral insulating oils complying with the requirements of this specification, of the same class and containing no additives shall be compatible with one another and be capable of being mixed in any proportion.*

2. REFERENCES

The following standard contains provisions which, through reference in the text constitute provisions of this specification. Unless otherwise stated, the latest edition (including amendments) shall apply.

IEC 60296: Specification for unused mineral oil for transformers and switchgear

IEC 60156: Insulating liquids – Determination of the breakdown voltage at power frequency–Test method

IEC 60247: Measurement of relative permittivity, dielectric dissipation factor and d.c. resistivity of insulating liquids

IEC 60475: Method of sampling liquid dielectrics

IEC 60666: Detection and determination of specified anti-oxidant additives in insulating oils

IEC 60814: Insulating liquids – Oil-impregnated paper and pressboard – Determination of water by automatic coulometric Karl Fischer titration

IEC 61125: Unused hydrocarbon based insulating liquids – Test methods for evaluating the oxidation stability

IEC 61198: Mineral insulating oils – Methods for the determination of 2-furfural and related compounds

IEC 61619: Insulating liquids – Contamination by polychlorinated biphenyls (PCBs) – Method of determination by capillary column gas chromatography

IEC 62021-1: Insulating liquids – Determination of acidity – Part 1: Automatic potentiometric titration

ISO 2719: Determination of flash point – Pensky-Martens closed cup method

ISO 3016: Petroleum products – Determination of pour point

ISO 3104: Petroleum products – Transparent and opaque liquids – Determination of kinematic viscosity and calculation of dynamic viscosity

ISO 3675: Crude petroleum and liquid petroleum products – Laboratory determination of density – Hydrometer method

DIN 51353: Testing of insulating oils; detection of corrosive sulfur; silber strip test

BS 2000-346: Methods of test for petroleum and its products Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions. Dimethyl sulphoxide extraction refractive index method

3. TERMS AND DEFINITIONS

For the purpose of this specification the definitions given in the reference standards shall apply.

4. REQUIREMENTS

4.1. Service Conditions

The mineral insulating oil shall be suitable for use in transformers and switchgears operating in the following conditions:

a) Continuous outdoor operation in tropical areas at altitudes of up to 2200m above sea level,
b) Humidity of up to 95%,
c) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C;
d) Heavy saline conditions along the coast and
e) Isokeraunic levels of up to 180 thunderstorm days per year.

4.2. Properties of oil

4.2.1. The oil shall be pure hydrocarbon mineral oil, clean and free from impurities, such as suspended solid matter, detrimental chemical compounds and water likely to impair its properties and without additives.

4.2.2. The oil shall be chemically stable, PCB (Polychlorinated biphenyls) free and shall conform to IEC 60296 (class 1: un-inhibited oil - mineral insulating oil, containing no antioxidant additives).

4.2.3. The functional properties of the oil which includes - viscosity, density, pour point, water content, breakdown voltage and dielectric dissipation factor – shall ensure total impact on its function as an insulating and cooling liquid.

4.2.4. The oil shall also be suitable for oil circuit breakers and other electrical equipment in which oil is used as insulating medium.

4.2.5. The tests on transformer oil shall be conducted in accordance with the relevant methods detailed in IEC 60296 and shall fully comply with the provisions of this specifications.

4.2.6. The characteristic and performance of the oil shall comply with the following:

Table 1: Required characteristics and performance

Description	Test Method	Requirement
a) – Function		
Viscosity at 40°C	ISO 3104	Max. 12 mm²/s
Viscosity at –30°C[1]	ISO 3104	Max. 1 800 mm²/s
Pour point	ISO 3016	Max. –40°C
Water content	IEC 60814	Max. 20 mg/kg
Breakdown voltage	IEC 60156	Min. 50kV
Density at 20°C	ISO 3675	Max. 0.895 g/ml
Dielectric dissipation factor at 90°C	IEC 60247	Max. 0.005
b) – Refining/stability		
Appearance:	--	Clear, free from sediment and suspended matter
Acidity	IEC 62021-1	Max. 0.01 mg KOH/g
Corrosive sulfur	DIN 51353	Not corrosive
Antioxidant additive	IEC 60666	Not detectable
Furfural content	IEC 61198	Max. 0,1 mg/kg
c) – Performance		
Oxidation stability	IEC 61125 (Method C). Test duration : 164 h	
- Total acidity		Max. 1.2 mg KOH/g
- Sludge		Max. 0.8 % by weight
d) – Health, safety and environment (HSE)		
Flash point	ISO 2719	Min. 135°C
PCA content	BS 2000 Part 346	Max. 3 %
PCB content	IEC 61619	Not detectable
[1] This is the standard LCSET for transformer oil. Pour point shall be minimum 10 K below LCSET (Lowest cold start energizing temperature)		

4.3. Quality Management System

4.3.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the mineral insulating oil physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008.

4.3.2. The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications including copy of valid and relevant ISO 9001: 2008 certificate shall be submitted with the tender for evaluation.

4.3.3. The bidder shall indicate the delivery time of the items, manufacturer's monthly & annual production capacity and experience in the production of the type and size of items being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the mineral insulating oil sold in the last five years as well as reference letters from at least four of the customers shall be submitted with the tender for evaluation.

5. TESTS AND INSPECTION

5.1. The mineral insulating oil shall be inspected and tested in accordance with the requirements of IEC 60296, applicable standards listed in clause 2 and the provisions of this specification. It shall be the responsibility of the supplier to perform or to have performed the tests specified and whatever other tests he normally performs at works.

5.2. Copies of previous Type Tests Reports issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. The accreditation certificate to ISO/IEC 17025 for the same third party testing laboratory used shall also be submitted with the tender document (all in English Language)

5.3. The mineral insulating oil shall be subject to acceptance tests at the manufacturer's works before dispatch. Acceptance tests shall be witnessed by two Engineers appointed by The Kenya Power and Lighting Company Limited (KPLC). Routine and Sample Test Reports for the oil to be supplied shall be submitted to KPLC for approval before delivery of the goods.

5.4. On receipt of the product, KPLC will perform any of the tests specified in order to verify compliance with this specification. The supplier shall replace without charge to KPLC the oil which upon examination, test or use; fail to meet any of the requirements in the specification.

6. MARKING AND PACKING

6.1 The following information shall be marked indelibly and legibly and in a permanent manner on each container.

i) Manufacturer's Name or Trademark;
ii) Type Designation/Classification;
iii) Specified Characteristics;
iv) Oil Quantity (in liters);
v) Batch Number & Date;
vi) Material Safety Data Sheet.

6.2 The oil shall be packed in 200 or 205 or 210 liters metallic drums protected against corrosion. The drums shall be clean and suitable for the purpose to avoid any contamination.

6.3 Each oil delivery shall be accompanied by a document from the manufacturer specifying at least: manufacturer's designation, oil classification, compliance certificate and indication of the presence (type, concentration) of any additive. Where the material safety data sheet cannot be marked on the container it shall be submitted together with the oil.

7. Documentation

7.1. The bidder shall submit its tender complete with technical documents required by Annex A (Guaranteed Technical Particulars) for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

a) Fully filled clause by clause description of the item on offer as per Annex A (Guaranteed Technical Particulars) and signed by the manufacturer;
b) Copies of the Manufacturer's catalogues, brochures, safety and technical data;
c) Sales records for the last five years and at least four customer reference letters;
d) Details of the manufacturer's experience;
e) Copies of required type test reports by a third party testing laboratory accredited to ISO/IEC 17025 and a copy of accreditation certificate to ISO/IEC 17025 for the third party testing laboratory;
f) Manufacturers letter of authorization, QMS certificate and other technical documents required in the tender.
g) The manufacturer shall be required to also provide detailed information regarding the products:
   - Materials identification,
   - Ingredients and hazards data,
   - Physical data of the chemicals used,
   - Health hazard information,
     - Summary of risks
     - Target organs
     - First aid to various organs such as eye contacts, skin contacts, inhalation and ingestion
   - Special precautions.
     - Storage segregation
     - Special handling/storage
     - DOT (Department of Transportation Hazard Classification System) class.

7.2. The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company for approval before manufacture:

a) Guaranteed Technical Particulars signed by the manufacturer;
b) Chemical composition details of the oil to be manufactured for KPLC.
c) Quality assurance plan (QAP) that will be used to ensure that the chemical and functional properties of the oil, tests, service capability, maintenance and documentation will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008
d) Detailed test program to be used during factory testing;
e) All documentation necessary for identification and general delivery requirements as specified in IEC 60296, clause 5.4 shall be provided with the oil.
f) Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the oil for The Kenya Power & Lighting Company;
g) Packaging details (including packaging materials and quantity).

7.3. The supplier shall submit a set of three (3) technical manuals for the oil during delivery specifying at least: supplier's designation, oil classification and compliance certificate. The supplier shall also indicate the presence (type, concentration) of any additive if any, all in the English Language, to KPLC stores.

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ANNEX A: **Guaranteed Technical Particulars** *(to be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records, four customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of complete type test reports for tender evaluation, all in English Language)*

Tender No. .....Bidders Name and address .....

Description	Bidder's offer (indicate full details of the values offered)
1. Manufacturer's Name & Country of Manufacture	
2. Type Designation, Standard & Volume of drum	
1. Scope	
2. Applicable Standards	
3. Terms & Definitions	
4. Requirements	
4.1. Service conditions	
4.2 Properties of oil	
4.2.1 – 4.2.4	
4.2.5 Required characteristics and performance	
a) Viscosity at 40^{0}C, ISO 3104	
b) Viscosity at –30°C, ISO 3104	
c) Pour point, ISO 3016	
d) Water content, IEC 60814	
e) Breakdown voltage – new oil, IEC 60156	
f) Density at 20°C, ISO 3675/ISO 12185	
g) Dielectric dissipation factor at 90°C, IEC 60247	
h) Appearance	
i) Acidity, IEC 62021-2	
j) Corrosive sulfur, DIN 51353	
k) Antioxidant additive, IEC 60666	
l) Furfural content, IEC 61198	
m) Oxidation stability, IEC 61125 (method C -Test duration - Uninhibited oil: 164 h) -Total acidity -Sludge	
n) Flash point ISO 2719	
o) PCA content BS 2000 Part 346	
p) PCB content IEC 61619	

4.3Quality Management Systems	
4.3.1 – 4.3.3	
5.0Tests and Inspection	
5.1 – 5.4	
6. Marking & Packaging	
6.1. Marking	
6.2 Packaging	
6.3 Delivery documents	
7. Documentation	
7.1 – 7.3	
8.0 Manufacturer's Guarantee and Warranty	
9.0 List catalogues, brochures, technical data and drawings submitted to support the offer.	
10.0 List customer sales records and customer reference letters submitted to support the offer.	
11.0 List Test Certificates submitted with tender	
12.0 List test reports of the oil to be submitted to KPLC for approval before shipment	
13.0 Statement of compliance to specification (indicate deviations if any & supporting documents)	
14.0 List Acceptance Tests to be witnessed by KPLC Engineers at the factory	

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Manufacturer's Name, Signature, Stamp and Date