Kenya Power

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**KP1/9AA-2/PT/20 - CS/14-15/JNM** **22nd December, 2014**

**M/s**

**Dear Sir,**

**ADDENDUM (I) TO TENDER NO. KP1/9AA-2/PT/20-CS/14-15 FOR SUPPLY, INSTALLATION AND COMMISSIONING OF LARGE POWER METERING SOLUTION**

The following amendments are made to the specified provisions of the Tender document for Supply, Installation and Commissioning of Large Power Metering Solution. Save where expressly amended by the terms of this Addendum, the Principal Tender Document 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 as part of the Principal Tender Document.

**1. CLAUSE 3.24.1 TENDER SECURITY**

Bidders shall provide bid security worth Ksh. 20 million instead of the 1% value of their tender.

**2. CLAUSE 6.2. OF THE EVALUTION CRITERIA.**

6.2.4: Correction has been made on the qualification of the project Manager as follows;-

| | | |
|---|---|---|
| Manager with a degree and above | - | 15Marks |
| Manager with Degree | - | 12Marks |
| Manager with Higher National Diploma | - | 8 Marks |
| Below Higher National Diploma | - | 0 Marks |

6.2.7: Delete the word "building projects "and replace with Electrical projects.

Bidders should also note that they shall submit details and documents evidence of the projects they have undertaken within the last 5 years worth over Ksh. 1 billion and not each worth 5 billion. The, marks shall be as follows:-

| | | |
|---|---|---|
| Above Ksh. 1 billion | - | 15Marks |
| Ksh. 1 billion | - | 12Marks |
| Below 1 billion to 800 million | - | 8 Marks |
| Below 800 million to 500 million | - | 4 Marks |
| Below 500m | - | 0 marks |

## 3. SUBMISSION OF SAMPLES

Bidders shall be required to submit the following samples for evaluation:

i) One complete sample for LV direct customer metering equipment
ii) One complete sample for LV CT metering equipment
iii). One complete sample of MV metering solution of 11KV (integrated CT/PT metering equipment).
iv). One complete sample of the 33kV/66kV/132 kV metering enclosure.

Add Clause 7.1.15. "Confirmation of submission of samples".

Add Clause 7.2.1.6(d). "Verification of submitted samples"

## 4. CLAUSE 8.14: PAYMENT TERMS.

The terms of payment have been revised to be as follows:-

Payment shall be thirty (30) days from satisfactory delivery and submission of invoice together with other required and related documents as per the following milestones.

1. 30% of the contract amount upon supply, installation and commissioning of ¼ of the meters and enclosures for all scenarios.
2. 20% of the contract amount upon supply, installation and commissioning of the second ¼ of the meters and enclosures for all scenarios.
3. 20% of the contract amount upon supply, installation and commissioning of the third ¼ of the meters and enclosures for all scenarios.
4. 20% of the contract amount upon supply, installation and commissioning of the fourth ¼ of the meters and enclosures for all scenarios.
5. 10% of the contract amount being retention after the defects liability period

*In very **exceptional** circumstances where a bidder requests for an advance payment and the same is accepted by KPLC, then, it will be limited to a maximum amount of 10% of the contract amount and subject to the following conditions:-*

***a). The bidder should provide a valid bank guarantee as a security for the advance covering the advance period .***

***b). The bidder agrees to an interest charge of 1.5% per month on the advanced amount, for the entire advance period.***

**5. AMENDMENTS TO THE TECHNICAL SPECIFICATIONS**

Bidders are advised that technical clarifications made to the tender area as follows:-

*1. Clause2.0: introduction; correction:* it should read Kenya Power has around 5,500 large power customers. These include three phase whole current customers, three phase CT customers, and High Voltage (11KV, 33KV, 66 KV and 132KV) metered customers.

2. *Clause 2.0 :( no.2-7) Typical scenario, should read;*

There are 7 typical scenarios of installation for these large power customers, listed as below:

1. Three phase whole current metered customers, indoor installation (415V, 100A)
2. Three phase LVCT metered customers (multi customers per transformer) (415V, 200/5A, 100/5A, 200/5A, 300/5A, 500/5A, 1000/5A, 1,500/5A and 2000/5A)
3. Three phase 11KV CT connected customer (overhead cable connected)
4. Three phase 11KV CT connected customer (underground cable connected)
5. Three phase 33KV PTCT connected customers
6. Three phase 66KV PTCT connected customer
7. Three phase132KV PTCT connected customer

*3. Clause 2.1: amendments, should read;*

The objective of the Project is to reduce electricity losses, increase collections and improve quality of electricity supply in KPLC. The project includes the design, supply, installation commissioning of all the KPLC's Large Power outdoor metering solution together with the central management system and associated Low and High Voltage Equipment.

4. *Clause 3.0 (no.1): amendments, should read;*

1. Design, supply, installation and commissioning of

a) tamper resistant electricity metering infrastructure (Tamper proof metering cabinets complete with SMART meters, CTs, PTs, breakers and associated cabling where applicable)

b) auditable central data management system that is open and capable of integrating with the existing billing system

*5. Clause 3.0 (no.4): amendments, should read;*

KPLC specifications will be availed to the contractor for reconstruction materials as in 3 above

*6. Clause 3.1: amendments, should read;*

The implementation of the outdoor metering system and central data management system shall cover all large power customers - KPLC tariffs (currently SC, C11, C12, C13, C14 and C15).

The expected scenarios in the new metering systems

*7. Clause 3.2.1: amendments, should read;*

**3.2.1 LV whole current metered customer**

a) The tenderer will supply all equipment including SMART meter, metering enclosure, circuit breaker, communication module complete with sensors, connections, switch, locks and associated components for full functioning of the metering system.

b) To secure the metering installation, all the metering equipment will be installed inside the same enclosure

c) The tenderer will remove the current installed meters and return to KPLC.

d) The power supply cables to the cabinet and the support structure will be supplied and installed by contractor.

*8. Clause 3.2.2 (a): amendments, should read;*

a) The tenderer will supply all the equipment including SMART meter, metering enclosure, CTs, air insulated circuit breaker, communication module complete with sensors, connections, locks and associated components for full functioning of the metering system.

*9. Clause 3.2.3 (a): amendments, should read;*

a) The tenderer will supply an integrated metering unit comprising of SMART meter, enclosure, CTs, PTs, communication module complete with sensors, connections, locks and all associated components for full functioning of the metering system.

*10. Clause 3.2.3 (f): additional, should read;*

f) The power supply cables to the cabinet and the support structure will be supplied and

installed by the tenderer.

*11. Clause 3.2.4(a): amendments, should read;*

a) The tenderer will supply an integrated metering unit comprising of SMART meter, metering enclosure, CTs, PTs, communication module complete with sensors, connections, locks and all associated components for full functioning of the metering system.

*12. Clause 3.2.4(f): additional, should read;*

f) The power supply cables to the cabinet will be supplied and installed by the tenderer.

*13. Clause 3.2.5(a): amendments, should read;*

a) The tenderer will supply all equipment including SMART meter, metering enclosure, communication module complete with sensors, connections, locks and all associated components for full functioning of the metering system.

*14. Clause 3.2.5(d): amendments, should read;*

d) The metering unit will be installed outdoors in the KPLC substation switch yard next to the existing CTs &PTs.

*15. Clause 3.2.5(f): correction, should read;*

f) The metering cables to the cabinet and the support structure will be supplied and installed by the tenderer.

*16. Clause 3.2.6(a): amendments, should read;*

a) The tenderer will supply all equipment including SMART meter, metering enclosure, communication module complete with sensors, connections, locks and all associated components for full functioning of the metering system.

*17. Clause 3.2.6(d): amendments, should read;*

d) The metering unit shall be installed outdoors in the KPLC substation switch yard next to the existing PTs and CTs.

*18. Clause 3.2.6(f): correction, should read;*

f) The metering cables to the cabinet and the support structure will be supplied and installed by the tenderer.

*19. Clause 3.2.7(a): amendments, should read;*

a) The tenderer will supply all equipment including SMART meter, metering enclosure,

communication module complete with sensors, connections, locks and all associated components for full functioning of the metering system.

*20. Clause 3.2.7(d): amendments, should read;*

d) The metering enclosure will be installed outdoors in the KPLC substation switch yard next to the existing PTs and CTs.

*21. Clause 3.2.7(f): correction, should read;*

f) The metering cables to the cabinet and the support structure will be supplied and installed by the tenderer.

*22. Clause 3.3(c and f): amendments, should read;*

c) Termination of Cables/Conductors from metering cabinet to customer

f) Installation of underground cable

*23. Clause 3.4(a to d) work plan: amendments, should read;*

The tenderer shall prepare a work plan for the tasks in the project implementation and submit for approval by the KPLC. The work plan shall detail the following:

a) Plan of activities and time lines
b) Safety, health and environmental concerns
c) work procedures
d) Efforts to reduce Loss of sales occasioned by power outages

*24. Clause 4.1.2: amendments, should read;*

The supplier shall be responsible for carrying out required tests (with the exception of (a) above) to confirm the correct operation of the metering solution.

*25. Clause 5.1.2.14: additional should read;*

The meters shall be equipped with auxiliary terminals for inputs and outputs.

For inputs, It shall be equipped with:

1. at least 2 control signal input, the voltage signal can be 240VAC
2. at least 4 Impulse signal input, the Impulse signal should be an open/close signal

For outputs, It shall be equipped with:

1. at least 4 control signal output, the control signal should be an pen/close signal, with Maximum 400VAC/DC, 100mA
2. at least 4 Impulse signal output, the Impulse signal should be an open/close signal, with Maximum 250VDC, 27mA.

*26. Clause 5.1.2.35: revised, should read;*

The meters shall have a **backlight-LCD** with **at least seven** (7)-numerical characters comprising of selectable integers and decimals points for measurement. The display must be associated with push buttons for parameter scrolling. Individual digit size shall be minimum 4 mm wide x 8 mm high. LCD is to be clearly readable within a viewing angle ±15° in either the horizontal or vertical direction. Nominal diminutions of the display shall be 75 mm X 23 mm.

*27. Clause 5.1.2.38: amendment, should read;*

Meters shall have provision for reading the meter even when mains power supply fails.

*28. Clause 5.1.2.42: amendment, should read;*

The meters shall have the relevant software and hardware for reading the data and configuring.

*29. Clause 5.1.2.43: amendment, should read;*

The meters shall be equipped with an RS485 or RS232 port for communication. The meters are to be read automatically through software and hardware to be specified separately in an AMI system. Communication protocol should be according to DLMS/COSEM

*30. Clause 5.1.2.1: (meter dimension in vertical position); correction, should read;*

The dimensions of the meter in a vertical position must not exceed 300mm*180mm*90mm. Save for any other dimension given elsewhere in the tender document.

*31. Clause 5.2.2.1: (meter dimension in vertical position); amendment, should read;*

The dimensions of the meter must not exceed the following values:

Width: 180 mm

Length: 300 mm

Height: 90 mm

Amendment applies to clause 5.3.2.1

32. Clause 5.2.2.2 amendment, should read;

The meters shall be constructed as 3 phase 4-wire meters.

33. Clause 5.2.2.3 Amendment, should read;

The meters shall have terminals with bottom entry for cables and the arrangement shall be L1V1L1: L2V2L2: L3V3L3: N for 3 phase 4-wire meters.

34. Clause 5.2.2.17 amendment should read;

The meters shall have a backup power supply to run the calendar clock for a minimum of 1 year without mains voltage. If the backup is by means of Lithium battery it shall have a shelf life of ten years.

*35. Clause 5.2.2.63: addition, should read;*

The meter shall support report to system when it is power on or off.

36. Clause 5.3.2.2 amendment, should read;

The meters shall be constructed with both options 3 phase 3-wire and 3 phase 4-wire meters configurable to either.

*37. Clause 6.3.1: correction, should read;*

The circuit breaker shall comply with IEC 60947-1&2 standards.

*38. Clause 6.3.3: addition, should read;*

The circuit breaker controller shall support both manual and automatic mode of operation.

*39. Clause 6.3.7: addition, should read;*

The circuit breaker (ACB) for LVCT metered customers shall be able to support remote disconnection and reconnection through the system software.

*40. 7.1.2: Clause (7.1.2.1 to 7.1.2.23) technical requirements,* ***amendments on the whole clause,***

7.1.2.1 The meter enclosure along with the doors shall be fabricated from stainless steel and capable of withstanding the mechanical, electrical and thermal stress as well as the effects of the humidity as per IEC 62262 standards.

7.1.2.2 The meter enclosure should have a minimum thickness of 1.0mm

7.1.2.3 The enclosure shall comply with IP 65 standard requirements

7.1.2.4 The enclosure' door shall be vandal proof.

7.1.2.5 The enclosure shall be fixed with inside hinges such that door hinges cannot be removed from outside.

7.1.2.6 The enclosure shall allow for over 120 degrees working space when the door is fully open

7.1.2.7 The enclosure shall be free standing and suitably design with 4 member support as site conditions may require.

7.1.2.8 The enclosure shall have provision for pole mounting, wall mounting or free standing on a concrete plinth as per site conditions.

7.1.2.9 The enclosure shall be equipped with earth terminal.

7.1.2.10 The cabinet jointing where necessary shall be by use of stainless screw/bolts.

7.1.2.11 The enclosure/ cabinet shall have a provision for sealing and locking.

7.1.2.12 The enclosure/ Cabinet Shall be able to send an alert to the central data analysis Centre if opened

7.1.2.13 The copper bus bars in the enclosure/ cabinet shall be arranged so that it is easy to connect incoming & outgoing cables.

7.1.2.14The bus bar installation in the enclosure shall always be stable when open/closed and heat stabilized. Good clearance shall be provided and the bus bar shall be well insulated.

7.1.2.15 The enclosure shall leave enough space to install meters, LV CTs, Controllable breaker, and related equipment's. Space between meters and cabinet shall be more than 60mm, space between meters & controlled breaker shall be more than 80mm.

7.1.2.16 The enclosure shall have a nameplate at the front bottom, the nameplate should be durable clear with the following details - manufacturer, model, main specifications, manufacture date.

7.1.2.17 The enclosure shall display with warning symbol - 'DANGER – HATARI'.

7.1.2.18 The cabinet shall have front transparent provision window for viewing the meter LCD display screen.

41. Clause**7.2.1 General Requirements-amendment should read;**

11KV MV Metering enclosure shall be designed to support 3Phase 4Wire metering configuration and as an integral part of the PT, CT .The wires or equipment's shall not be exposed in the open air. During the installation, the whole metering equipment's shall be installed as an integrated part. The data from meter shall be accessed both locally and remotely.

*42.7.2.2: Clause (7.2.2.1 to 7.2.2.12)11KV MV metering enclosure technical requirements,* ***amendments on the whole clause,***

7.2.2.1 The enclosure shall comply with IP 65 standard requirements

7.2.2.2 The enclosure shall be safe and easy to operate when door opened.

7.2.2.3 The enclosure/ cabinet shall have a provision for sealing and locking.

7.2.2.4 The enclosure shall be made from cold rolled closely annealed (CRCA) mild steel of2.5mmthickness.

7.2.2.5The enclosure shall be pebble grey (RAL 7035) powder coated. The coat thickness shall be 80micron

7.2.2.6 The enclosure shall have access detection with alarm relaying to Central management system.

7.2.2.7 The time of opening and closing the enclosure cabinet shall be recorded by the system.

7.2.2.8 The enclosure shall have enough space to install smart meter, communication equipment's, connecting terminals and necessary wiring space.

7.2.2.9 The wiring in the enclosure shall be neat with each wire clearly labeled and consistent with the connection diagram of the enclosure.

*43. Clause (7.3.2.1to7.3.2.20) Enclosure requirements,* ***amendments on the whole clause,***

7.3.2.1 The meter enclosure along with the doors shall be fabricated from stainless steel and capable of withstanding the mechanical, electrical and thermal stress as well as the effects of the humidity as per IEC 62262 standards.

7.3.2.2 The enclosure shall meet IP 65 standard

7.3.2.3 The enclosure' door shall be vandal proof.

7.3.2.4 The enclosure shall be fixed with inside hinges such that door hinges cannot be removed from outside.

7.3.2.5 The enclosure shall allow for over 120 degrees working space when the door is fully open

7.3.2.6 The enclosure shall be designed such that it can be mounted on steel structure in a substation switch yard.

7.3.2.7 The enclosure shall be equipped with earth terminal.

7.3.2.8 The enclosure shall have a provision for sealing and locking.

7.3.2.9 The enclosure shall have access detection with alarm relaying to Central management system.

7.3.2.10 The time of opening and closing the enclosure cabinet shall be recorded by the system.

7.3.2.11 The cabinet shall have enough space to install smart meter, communication equipment's, connecting terminal and necessary wiring space.

7.3.2.12 The enclosure shall have a nameplate at the front bottom, the nameplate should durable clear with the following details - manufacturer, model, main specifications, manufacture date.

7.3.2.13 The enclosure shall display a warning symbol - 'DANGER – HATARI'.

7.3.2.14 The cabinet shall have front transparent provision window for viewing the meter LCD display screen

7.3.2.15 The wiring in the enclosure shall be neat with each wire clearly labeled and consistent with the connection diagram of the enclosure.

*44. Clause 8.4.10;* **deleted**

*45. Clause 9.0, 9.1, 9.2, 9.3, 9.4 and 10.0 deleted (***No of provision of HHU requirement and Meter data analysis Center (MDAC))**

46. Clause. *Appendix A and B:* ***amendments on following items of the summary tables;***

**I Summary of Technical Specifications for LV CT & HT meter**

| NO | Specification | Unit | Requirement | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|---|---|
| 7 | Max. meter's Dimensions with terminal cover ( Height * Width *Length ) | mm | 300×180×90 | | |
| 16 | Meter enclosure protection (without suction test) | - | At least IP 54 | | |
| 17 | Operation range | °C | -1 < Operation range <+60 | | |
| 20 | Operation range of | % | 0 to 90 | | |

| NO | Specification | Unit | Requirement | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|---|---|
| | humidity | | | | |
| 21 | Accuracy class for active energy | - | Class I | | |
| 56 | Measure harmonic 3 phases voltage | - | Total, 3-32 odd harmonic | | |
| 62 | Measure harmonic 3 phases current | - | Total, 3-32 odd harmonic | | |

**II Summary of Mandatory Technical specifications of whole current Meter**

| | Specification | Unit | Requirement | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|---|---|
| 3 | Nominal Current Requirement | A | 10A | | |
| 7 | Max. meter's Dimensions with terminal cover ( Height * Width *Length ) | mm | 300×180×90 | | |
| 20 | Accuracy class for active energy | - | Class I | | |
| 57 | Measure voltage angle | - | BA,CB, AC | | |
| 58 | Measure voltage angle | - | BA, CB, AC | | |

**Appendix C**

**Specifications Matrix for Large Power Outdoor metering solution**

| CLAUSE | KENYA POWER REQUIREMENT | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|
| 6.3.1 | Comply with IEC 60947-1&2 standard. | | |
| 6.3.3 | Support both manual and automatic mode of operation. | | |
| 6.3.7 | Circuit breaker (ACB) for LVCT metered customers shall be able to support remote disconnection and reconnection through the system software. | | |
| **7.0** | **Metering Enclosures** | | |
| **7.1** | **LV Metering Enclosure Requirements** | | |
| **7.1.1** | **General Requirements** | | |
| | SMART equipment | | |
| 7.1.2 | **Technical requirements** | | |
| 7.1.2.1 | Fabricated from stainless steel and capable of withstanding the mechanical, electrical and thermal stress as well as the effects of the humidity as per IEC 62262 standard | | |
| 7.1.2.2 | Minimum thickness of 1.0mm | | |
| 7.1.2.3 | Comply with IP65 standard requirements | | |
| 7.1.2.4 | Door shall be vandal proof. | | |
| 7.1.2.5 | Fixed with inside hinges such that door hinges cannot be removed from outside. | | |
| 7.1.2.6 | Allow for over 120 degrees working space when the door is fully open | | |
| 7.1.2.7 | Free standing and suitably design with 4 member supports as site conditions may require. | | |
| 7.1.2.8 | Have provision for pole mounting, wall mounting or free standing on a concrete plinth as per site conditions. | | |
| 7.1.2.9 | Be equipped with earth terminal. | | |

| CLAUSE | KENYA POWER REQUIREMENT | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|
| 7.1.2.10 | The cabinet jointing where necessary shall be by use of stainless screw/bolts. | | |
| 7.1.2.11 | A provision for sealing and locking. | | |
| 7.1.2.12 | Send an alert to the central data analysis Centre if opened. | | |
| 7.1.2.13 | The copper bus bars in the enclosure/ cabinet arranged so that it is easy to connect incoming & outgoing cables. | | |
| 7.1.2.14 | The bus bar installation in the enclosure be stable when open/closed and heat stabilized. Good clearance shall be provided and the bus bar shall be well insulated. | | |
| 7.1.2.15 | Enough space to install meters, LV CTs, Controllable breaker, and related equipment's. Space between meters and cabinet shall be more than 60mm, space between meters & controlled breaker shall be more than 80mm. | | |
| 7.1.2.16 | Have a nameplate at the front bottom | | |
| 7.1.2.17 | Display with warning symbol - 'DANGER – HATARI'. | | |
| 7.1.2.18 | Front transparent provision window for viewing the meter LCD display screen. | | |
| **7.1.3** | **Enclosure installation requirements** | | |
| **7.1.3.1** | **Meter installation** | | |
| 7.1.3.1.1 | Installed conveniently, safely and firmly | | |
| 7.1.3.1.2 | Installed in the cabinet other than the cabinet door | | |
| 7.1.3.1.3 | Vertically installed and all the mounting holes fixed by bolting | | |
| 7.1.3.1.4 | Mounting hole threaded hole or other hole type | | |

| CLAUSE | KENYA POWER REQUIREMENT | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|
| **7.2** | **11KV metering Enclosure** | | |
| **7.2.1** | **General Requirements** | | |
| | PT/CT & enclosure Integrated | | |
| **7.2.2** | **11KV MV metering enclosure technical requirements** | | |
| 7.2.2.1 | Comply with IP 65 standard requirements | | |
| 7.2.2.2 | Safe and easy to operate when door opened. | | |
| 7.2.2.3 | A provision for sealing and locking. | | |
| 7.2.2.4 | Made from cold rolled closely annealed (CRCA) mild steel 2.5mm thick. | | |
| 7.2.2.5 | Pebble grey (RAG 7035) powder coated. | | |
| 7.2.2.6 | Have access detection with alarm relaying to Central management system. | | |
| 7.2.2.7 | Time of opening and closing the enclosure cabinet shall be recorded by the system. | | |
| 7.2.2.8 | Enough space to install smart meter, communication equipment's, connecting terminals and necessary wiring space. | | |
| 7.2.2.9 | Wiring clearly labeled and consistent with the connection diagram of the enclosure | | |
| **7.3** | **33KV /66KV/ 132KV metering enclosure** | | |
| **7.3.1** | **General Requirements** | | |
| | Provide solution for outdoor metering | | |
| **7.3.2** | **Enclosure requirements** | | |
| 7.3.2.1 | Fabricated from stainless steel and capable of withstanding the mechanical, electrical and thermal stress as well as the effects of the humidity as per IEC 62262 standards. | | |

| CLAUSE | KENYA POWER REQUIREMENT | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|
| 7.3.2.2 | Shall meet IP 65 standard | | |
| 7.3.2.3 | Door shall be vandal proof. | | |
| 7.3.2.4 | Inside hinges such that door hinges cannot be removed from outside. | | |
| 7.3.2.5 | Allow for over 120 degrees working space when the door is fully open | | |
| 7.3.2.6 | Can be mounted on steel structure in a substation switch yard. | | |
| 7.3.2.7 | Shall be equipped with earth terminal. | | |
| 7.3.2.8 | A provision for sealing and locking. | | |
| 7.3.2.9 | Shall have access detection with alarm relaying to Central management system. | | |
| 7.3.2.10 | Time of opening and closing the enclosure cabinet shall be recorded by the system. | | |
| 7.3.2.11 | Shall have enough space to install smart meter, communication equipment's, connecting terminal and necessary wiring space. | | |
| 7.3.2.12 | Nameplate at the front bottom, the nameplate should durable clear with the following details - manufacturer, model, main specifications, manufacture date. | | |
| 7.3.2.13 | Display a warning symbol - 'DANGER – HATARI'. | | |
| 7.3.2.14 | Front transparent provision window for viewing the meter LCD display screen | | |

| CLAUSE | KENYA POWER REQUIREMENT | MANUFACTURER'S COMPLIANCE/REMARKS | REFERENCE PAGE IN THE SUBMITTED DOCUMENTS |
|---|---|---|---|
| 7.3.2.15 | Wiring clearly labeled and consistent with the connection diagram of the enclosure. | | |

*47. Clause 4.3.6 (Specifications for low voltage ring type measuring current transformers) amendment, should read;*

The value of the rated output shall be ≥ 5 VA

**Appendix G (Additional Information on KPLC Sample Cables and CTs ratios)**

**I Sample LV Standard Over Head Cables and Conductors used in KPLC**

| CONDUCTOR SIZE [mm2] | RATED CURRENT [A] | RATED CAPACITY [kVA] |
|---|---|---|
| PVC 25 4/c | 87 | Over 60 to 105 |
| PVC 70 4/c | 155 | Over 107 to 145 |
| PVC 120 4/c | 210 | Over 145 to 186 |
| PVC 185 4/c | 270 | Over 187 to 345 |
| PVC 300 4/c | 355 | Over 346 to 345 |
| PVC 300 s/c (in ducts) | 330 | |
| 630 S/c | 433 | 300 |
| AA 50 | 181 | 125 |
| AA100 | 271 | 188 |

**II Sample Underground Service line cables for 11 KV and 33 KV used in KPLC**

| | Conductor size [$mm^2$] | dia. over cord. [mm] | Insulation thickness [mm] | overall dia [mm] | cable mass [kg/km] | D.C Resistance at $20^0$C [Ohm/km] | Reactance at 50 Hz [Ohm/km] | Current rating in duct [Amps] |
|---|---|---|---|---|---|---|---|---|
| 6.35/11 kV XLPE | 95 3/C (Al) | 11.54 | 3.4 | 34.10 | 3345 | 0.320 | 0.100 | 180 |
| | 185 3/c (Al) | 16.10 | 3.4 | 39.50 | 4800 | 0.164 | 0.091 | 255 |
| | 300 3/C (Al) | 21.45 | 3.4 | 45.30 | 6635 | 0.100 | 0.085 | 330 |
| | 300 3/C (Cu) | 21.45 | 3.4 | 45.30 | 12455 | 0.060 | 0.085 | 420 |
| 6.35/11 kV PILC | 50 3/C (Al) | - | 2.8 | 37.10 | 5800 | 0.641 | 0.093 | 120 |
| | 95 3/C (Al) | - | 2.8 | 44.00 | 7100 | 0.320 | 0.085 | 175 |
| | 185 3/C (Al) | - | 2.8 | 53.80 | 9900 | 0.164 | 0.079 | 255 |
| | 300 3/C (Al) | - | 2.8 | 63.70 | 14100 | 0.100 | 0.075 | 335 |
| 19/33 kV XLPE | 95 S/C (Al) | 11.54 | 3.4 | 45.10 | 1330 | 0.320 | 0.085 | 185 |
| | 185 S/C (Al) | 16.10 | 3.4 | 51.40 | 3370 | 0.164 | 0.079 | 260 |
| | 300 S/C (Al) | 21.45 | 3.4 | 57.20 | 4165 | 0.164 | 0.079 | 330 |

## III A Guide to Distribution of CT Ratios for Existing Large Power Customers in KPLC

| No | DESCRIPTION | CTs RATIO RANGE | QUANTITY |
|---|---|---|---|
| 1 | LV Whole Current metered customers | 10-120A | 1044 |
| 2 | LV CT metered Customers | | |
| | (i) LV CT metered Customers | 100/5A- to- 300/5A | 2064 |
| | (ii) LV CT metered Customers | 400/5A- to- 1000/5A | 1623 |
| | (iii) LV CT metered Customers | 1500/5A- to- 2000/5A | 265 |
| 3 | 11KV metered Customers (Both Over Head and Underground) | | |
| | (i) 11KV metered Customers | 20/5A- to- 100/5A | 78 |
| | (ii) 11KVmetered Customers | 120/5A- to- 200/5A | 63 |
| | (iii) 11KV metered Customers | 250/5A- to- 400/5A | 7 |
| | (iv) 11KV metered Customers | 500/5A- to- 600/5A | 4 |
| | (v) 11KV metered Customers | 50/1A- to- 100/1A | 122 |
| | (vi) 11KV metered Customers | 200/1A- to- 400/1A | 53 |
| | (vii) 11KVmetered Customers | 800/1A- to- 1200/1A | 3 |
| 4 | 33 KV metered Customers (Both Over Head and Underground) | | |
| | (i) 33KV metered Customers | 50/5A- to- 100/5A | 7 |
| | (ii) 33KVmetered Customers | 200/5A- to- 400/5A | 5 |
| | (iii) 33KV metered Customers | 500/5A- to- 1000/5A | 1 |
| | (iv) 33KV metered Customers | 25/1A- to- 50/1A | 2 |
| | (v) 33KV metered Customers | 100/1A- to- 200/1A | 17 |
| | (v) 33KV metered Customers | 250/1A- to- 300/1A | 1 |
| | (vi) 33KVmetered Customers | 400/1A- to- 500/1A | 1 |
| 5 | 66 KV metered Customers | | |
| | (i) 66KV metered Customers | 50/5A- to- 100/5A | 6 |
| | (ii) 66KVmetered Customers | 200/5A- to- 500/5A | 2 |
| | (iii) 66 KV metered Customers | 50/1A- to- 100/1A | 7 |
| | (iv) 66 KV metered Customers | 200/1A- to-250/1A | 7 |
| 6 | 132 KV metered Customers | | |
| | (i) 132 KV metered Customers | 12.5/5A- to- 50/5A | 6 |
| | (ii) 132 KVmetered Customers | 200/5A- to- 300/5A | 4 |
| | (iii) 132 KV metered Customers | 800/1A- to- 1000/1A | 3 |
| | (iv) 132 KV metered Customers | 25/1A- to-50/1A | 4 |
| | (v) 132 KV metered Customers | 150/1A- to- 200/1A | 8 |
| | (vi) 132 KVmetered Customers | 800/1A- to- 1000/1A | 3 |
| | TOTAL | | 5410 |

**6. TENDER CLOSING DATE**

**The tender closing date has been extended so as to close on 20.01.2015 at 10.0 a.m.**

All the other terms and conditions remain as per the tender document.

Yours faithfully,

**For: KENYA POWER & LIGHTING COMPANY LIMITED.**

**ENG. JOHN OMBUI**
**GENERAL MANAGER, SUPPLY CHAIN**