THE HASHIMITE KINGDOM OF JORDAN
NATIONAL ELECTRIC POWER CO.

P.O. BOX 2310

AMMAN 11181

المملكة الأردنية الهاشمية
شركــة الكهربــاء الوطنيــة م.ع
ص.ب 2310

عمان 11181

TENDER NO. 16/2026

SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

1. Invitation To Tender.
2. Instructions To Tenderers.
3. Forms of Tender.
4. Conditions Of Contract.
5. Technical specification and drawings.
6. Technical Schedules.
7. Price Schedules.

TENDERER

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NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

SECTION 1

- INVITATION TO TENDER

- TENDER ACKNOWLEDGEMENT

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

INVITATION TO TENDER

The National Electric Power Company (NEPCO) intends to have a loan and /or from NEPCO's own sources towards the cost of supply of ENERGY METERS & ANCILLARY EQUIPMENT as mentioned in the tender documents and specifications.

The National Electric Power Company hereby invites sealed Tenders from eligible Tenderers for design, manufacture, inspection, testing, packing for export, supply CFR Aqaba, setting to Works and **warranty for a period of (24) months** from the date of receipt of last consignment at site or NEPCO warehouses.

Interested Eligible Tenderers may obtain further information at the office of:

National Electric Power Company
PO Box 2310
11181 Amman
Jordan

Telephone: +(962) 6-5858615
Telefax: +(962) 6-5818336

A complete set of Tender Documents may be purchased by any interested eligible Tenderer on application to the above and upon payment of a non-refundable fee of **JD 200 (Two hundred Jordanian Dinars).**

The enclosed Tender Acknowledgement should be returned to the National Electric Power Company.

Tenders must be delivered to The Tenders Committee (**in the form of two envelopes**, **one envelope for Technical and Financial offer and one envelope for Bid Bond**), National Electric Power Company at the above address not later than 14.00 noon Amman time on **MONDAY 06/04/2026**

All Tenders must be accompanied by a Tender Guarantee in the amount of **JD 7800 (Seven thousand and eight hundred Jordanian Dinars)** in the form of a Bank Guarantee issued directly by an approved Bank located in Jordan and in the form provided in the Tender Documents.

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

TENDER ACKNOWLEDGEMENT

National Electric Power Co
P.O. Box 2310
11181 Amman
Jordan

Telefax: 00 +(962) 6-5818336

Attention: The Managing Director,

Dear Sirs

We the undersigned

_____

Acknowledge receipt of the Tender Documents for Tender Number (16/2026) comprising one copy of each of the following:

- Invitation for Tenders, Instructions to Tenderers, Conditions of Contract and Tender Forms.
- Technical Specification and Drawings.
- Technical Schedules.
- Price Schedules.

We wish to receive any further information concerning this Tender at the following address:

Name:

_____

Address:

_____

_____

_____

Our local agent in Jordan is:

Name:

_____

Address:

_____

_____

_____

In case of not submitting this form to NEPCO before closing date, it is the Tenderer responsibility of not receiving correspondence, amendments to the tender, addendums… etc.

Section 2

INSTRUCTIONS TO PERSONS TENDERING

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

INSTRUCTION TO PERSON TENDERING

1. The Tender shall be made in one copy on the accompanying form of tender with all blanks therein and in all the Schedules duly filled up in ink and signed, The Tender price shall include all incidental and contingent expenses. In particular, the Form of Tender must be completed and signed without alteration.

Tenderers are particularly directed that the amount entered on the Form of Tender shall be a fixed price for performing the Contract strictly in accordance with the bond document and shall be the sum total of all the amounts printed into and entered by the Tenderer upon the Schedule of Prices.

Should the Tenderer consider that he can offer any advantages to the purchaser by a modification to the Specification he may draw attention to such by an attached document stating the change in the amount of his Tender if such modification is accepted by the Purchaser, but the total entered on the Form of Tender shall be such as represents complete compliance with the bound document.

2. No alteration shall be made in the Form of Tender or in the Schedules there to except in filling up the blanks as directed, If any such alteration to be made or if these Instructions will not be fully complied with the Tender may be rejected. The Tenderer, however, is at liberty to add any further details that he may deem desirable and, in the event of his so doing, shall print or type such details and annex the added matter to the Tender submitted by him. Such additional details shall not be binding upon the Purchaser unless they shall be subsequently incorporated in the Contract.

3. The Tenderer shall submit with his Tender in order of the relevant clauses, a statement of any departures from the Specifications. Notwithstanding any description, drawings or literature which may be submitted, all details other than those in the Statement of Departures shall be assumed to be in accordance with the Specifications.

4. Although IEC Recommendations and British Standards for workmanship, equipment and materials, have been selected in this Specification as a basis of reference, standards and specifications of other countries and recommendations of other international standard organizations will be acceptable provided they are substantially equivalent to the designated Standards and provided furthermore that the Tenderer submits for approval Specifications which he proposes to use.

5. References to brand names or catalogue numbers, if any, in this Specification have been made only for that equipment for which it has been determined that a degree of standardization is necessary to maintain certain essential features, In certain instances such references have also been made for purpose of convenience to specify the requirements. In either case, offers of alternative goods which have similar characteristics and provide performance and quality at least equal to those specified are acceptable.

6. Pre-Tender Meeting and Site Visit:

6.1 The Bidder is advised to attend the pre-bid meeting and site visit. A pre-bid meeting and site visit shall be held as mentioned in the invitation letter in NEPCO offices.

6.2 The Bidder is advised to visit and examine the site and surroundings where the Facilities are to be installed and obtain for itself on its own responsibility all information that may be necessary for preparing the tender and entering into a contract. The costs of visiting the site shall be at the Bidder's own expense.

6.3 The Bidders shall visit the site and make himself aware of the details of the existing system/facilities. Modification work at the associated substations shall be compatible with the existing system, site visit is a must during bidding stage, the bidders are responsible to arrange for such site visit and such site visit will also be approved by NEPCO.

6.4 Where the Bidders and any of its personnel or agents have been granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, the Bidders, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury (whether fatal or otherwise) , loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the visit.

6.5 Failure to investigate the Site shall not relieve the Bidders from responsibility for estimating properly the difficulty or cost of successfully performing the Works.

6.6 If the site visit cancels a report of the site visit carried out by NEPCO will be provided.

7. In the event that the intending signatory does not manufacture one or more of the main sections of equipment and materials, then the Tender submitted should give evidence to show that all the obligations imposed by the documents on the intending signatory have been fully understood and accepted, where applicable, by the manufacturer (s) to whom it would be intended to subcontract one or more of the main sections of the equipment and materials.

8. If the Tenderer has any doubt as to the meaning of any portion of the General Conditions or the Specifications or Drawings, he shall when be submitting his Tender, set out in his covering letter the interpretation on which he relies.

9. The purchaser does not bind himself to accept the lowest or any tender, nor to assign any reason for the rejection of any tender, nor to purchase the whole of the equipment and materials specified.

10. The purchaser will not be responsible for, nor pay for, any expense or loss, which may be incurred by a Tenderer in the preparation of his Tender.

11. One copy of the Tender, and its accompanying documents, filled up as directed, together with the drawings called for must be enclosed in a secure envelope endorsed (Tender for Contract No. 16/2026, should be submitted to the Managing Director, National Electric Power Company, P.O. Box 2310, Amman 11181 The HASHEMITE KINGDOM OF JORDAN, by the time stated in the covering letter.

12. No tender received after that time will be considered.

13. All correspondence in connection with this Tender and Contract and all matter accompanying the Tender which is relevant to its examination shall be in the English language and expressed in metric units.

14. The Tender is to be held open for acceptance or rejection for **a validity period of (90) days from the time fixed for opening the Tenders.**

15. A non-refundable fee of JD **(200 Jordanian Dinar)** will be charged for each set comprising one copy of the Tender Documents.

16. The Tender shall be accompanied by a Tender Bond in the form of a Bank Guarantee valid for at least 90 days from the time **fixed** to Tender closing date, or a certified cheque in favour of and payable to the Purchaser for a sum of **JD 7800 (Seven thousand and eight hundred Jordanian Dinars)** as guarantee of good faith.

17. This Bond is to be issued by any approved Bank in Jordan. The Bond will be returned to the unsuccessful Tenderer according to **Regulation No. (8) For the year 2022 Government Procurements Regulation**. In the case of the successful Tenderer the Bond will, subject to the Conditions of Contract, be returned as soon as a formal Contract Agreement and a performance Bond have been entered into.

18. Tenders received prior to the time fixed for opening will be securely kept, unopened. Tenders received after that time will be rejected. The Purchaser bears no responsibility for premature opening of Tenders not properly addressed or identified.

19. Tenders may be withdrawn by formal request received in writing from the Tenderer prior to the time fixed for opening. If for any reason the Tender should be withdrawn after the time fixed for opening and before expiry of the said validity period, the Purchaser has the right to retain the full value of the Tender Bond.

20. A) Any arithmetical error shall be corrected by a decision of the procurement committee and the bidder must be notified accordingly, provided that the arithmetical corrections are as follows:

1. In the event of a discrepancy between the unit price and the total amount, the unit price shall be adopted and the total price shall be corrected accordingly unless there is clear evidence that the decimal point is misplaced.
2. If there is an error in the total amounts in the Bill of Quantities as a result of the addition and subtraction processes of the sub-totals, the subtotals shall be adopted and the total price shall be corrected accordingly.
3. In the event of a discrepancy between the unit price, in figures and in writing, the unit price that mentioned in writing shall be adopted unless the procurement committee finds a basis for the adoption of the price mentioned in figures.
4. If any bidder does not accept the correction of the errors after the analysis and evaluation, its submission shall be excluded and the bid bond shall be forfeited by a decision of the procurement committee.
5. If the bidder has not priced one or more of the items in the works and technical services tendering, these unquoted items shall be considered to be loaded on the other items of the tender, and the bidder shall execute them free of charge, if the tender has been awarded to it, whether the bidder attaches or does not attach those items in the tender.

B) Subject to the provisions of paragraph (a) of this Article, the basis for the examination of submissions included in the unified works contract for the construction projects shall be adopted.

21. Where compliance with a specific Standard Specification is called for the Standard Specification used shall be that in force at the time of Tender.

22. The successful Tenderer shall abide by the commercial and professional regulations as required by the Ministry of Industry & Trade, Engineering Association, Jordan contractor's association and other relevant Institutions in Jordan. (If applicable).

23. The Tenderer may state the Tender Price in Jordanian Diners. If, however, a portion of the Tenderers expenditure under the Contract is expected to be made in countries other than Jordan he may state a corresponding foreign currency portion of the Tender Price in the currencies of those other countries.

24. Tender evaluation will be consistent with the terms and conditions set for in the Tender documents.

In addition to the Tender Price, adjusted to correct arithmetical errors, other relevant factors such as the time of completion of delivery or construction, operating costs where applicable or the efficiency and compatibility of the equipment, the availability of service and spare parts, and reliability of construction methods proposed will be taken into consideration to the extent and in the manner specified in the Tender documents, in determining the evaluated Tender most advantageous to the Purchaser.

25. For comparison of all Tenders, the currency or currencies of the Tender Price for each Tender will be valued in terms of Jordan Dinars. The rates of exchange to be used in such valuation will be the selling rates published by the Central Bank of Jordan, and applicable to similar transactions, on the day of Tenders closing date unless there should be a change in the value of the currencies before the award is made. In the later case, the exchange rates prevailing at the time of the decision to notify the award to the successful Tenderer may be used.

26. Stamp duty and award fees are payable on Jordanian Contracts according to Jordanian laws, it is the Contractor's responsibility to purchase legal stamps to the requisite amount depending on the Contract Value, these fees should be paid within 10 days of the date of LOA and before signing the contract to the Ministry of Finance, otherwise penalties will be imposed according to laws and regulations.

If the final contract price is increased during or after completion of the works, contractor shall pay extra stamp duty and award fees proportional to the amount of increase.

27. <u>Penalty of Delivery Delay:</u>

Penalty equals (0.005) of value of the contract for each complete week on the delay of materials delivery and should not exceed (15%) of the total value of the contract.

28. Before signing the contract and within 28 days from date Letter of Award, the successful Tenderer shall furnish an irrevocable and **unconditional Performance Bond of (15%) of the total contract price** in the form given and in the same contract currency, and you are required to extend the validity of the Bid Bond until the Performance Bond has been established and accepted by NEPCO.

The Performance Bond shall be valid for a period expiring at least one month after receipt of the last CONSIGNMENT at site or NEPCO warehouse and shall still enforce until submission of the maintenance Guarantee for the Guarantee Period.

Failure of the successful Tenderer to comply with the requirements of above Sub-Clause shall constitute sufficient grounds for the annulment of the award and forfeiture of the tender security, in which event the Employer may make the award to the next lowest evaluated Tenderer or call for new tenders.

If any variation order has been issued to increase the contract price during the contract duration, the contractor must increase the performance bond to the value of (15%) of the increased amount.

The contractor shall seek for releasing Performance Bond upon fully finalized all contractual terms required and submit of maintenance Guarantee.

29. For overseas transport, the Contractor and his sub-contractors Suppliers and Manufacturers shall give priority to Jordan National Line Co., and to Arab shipping companies and their subsidiaries for, the shipping of goods, materials and Plant provided such companies ships call at the port of export. The Contractor shall also give priority to the Royal Jordanian Airlines for airfreight shipment and transport of personnel. Shipment by sea freight must be on direct and regular (liner) vessel less than 15 years old at the time of shipment. The vessel should be classified and in accordance with (ISM) code and should be a member in the P&I club

30. Any further information may be obtained on application in writing to:-

Managing Director

National Electric Power Company,

P.O. Box 2310, Amman, 11181

The Hashemite Kingdom of Jordan.

31. The Contractor should print NEPCO Stock Code No. on the supplied Materials which can be obtained in due time.

32. The bid bond shall be submitted either by the supplier or by the vendor on behalf of supplier in condition that he is fully authorized by Power of attorney letter from the supplier.

33. Tenderer must submit country of origin and name of manufacturer for the offered goods.

34. Tenderer shall submit his offer based on single price, excluding all custom duties and sales tax.

35. Tenderer must fill the schedules of bill of quantities incorporated with breakdown prices of this tender.

36. Tenderer must complete the technical data sheets of this tender.

37. **Complete offer shall be complete order; partial offer will not be accepted.**

38. Alternative Offers:

Bidders may submit Alternative Tenders, in addition to the requested Tenders, provided that they include complete technical justifications and meet the basic performance and technical criteria. Bidders offering Alternative Tenders shall also indicate price differences from the main Tender and any variations to the Time Schedule and other contractual and commercial terms of the Contract (Alternative offers which have similar characteristics and provide performance and quality at least equal to those specified as mentioned in tender documents are applicable and accepted).

39. Insurance:

NEPCO undertakes to insure all the shipped materials and equipment's with local Jordanian companies against all risks from the time they leave the works until they are delivered at site or at NEPCO warehouse.

The contractor must provide full details of the material to be dispatched in good time for NEPCO to arrange for marine insurance before material is actually dispatched.

40. Payments:

Terms of payment for this contract will be strictly according to paragraph No.9 (Terms of Payment) of General Conditions of the Contract.

41. Contract Incoterms:

For execution of this contract, the chosen incoterms are as follows:

"CFR – Aqaba port - Jordan Incoterms 2020"

In case of locally manufactured materials and the awarding has been done into local Jordanian company the required delivery and prices will be assumed as (delivery to NEPCO Stores).

42. This document is subject to the provisions and instructions of the **Government Procurement Regulation No. (8) Of 2022**.

43. Tenderers Eligibility and Qualification:

In order to satisfy the requirements for eligible experience, the Tenderer shall provide documentary evidence to establish:

A. That, in the case of a Tenderer offering to supply materials and equipment under the contract which the Tenderer does not manufacture or otherwise produce, **the Tenderer has been duly authorised by the manufacturer or producer of the materials and equipment to supply them in the employer's country (authorised certificate shall be provided)**.

B. Documentary evidence of the Tenderers qualification to perform the Contract and the Tenderer has the technical capacity and production capability necessary to perform the contract. In particular, it is required that:

- **The Tenderer shall provide documentation, certified by the owner (Two End user certificates), to show that the ENERGY METERS AND VOLTAGE SELECTION RELAYS to be supplied, having the type and rating (same or above) and the same place of manufacture, is in successful**

commercial service for a minimum of two years in two different countries within the last 10 years (2016- 2025).

- End user certificate should conform the following:
  - Certified (signed and stamped) by the owner of the material (end user) not from the contractor In English language, printed officially and stamped,
  - End-user certificate shall show clearly the following:
    a. Name of customer/company and complete address where equipment is installed.
    b. Date of issuance of certificate.
    c. Date of put in operation.
    d. Rating, capacity of related equipment

Original performance certificate maybe returned, if required by tenderer.

C. <u>The Tenderer shall provide documentation, certified by the owner (Type Test),</u> to show that the <u>ENERGY METERS, METARING PANLES AND VOLTAGE SELECTION RELAYS</u> to be supplied, having similar type or above and the same place of manufacture, passed the type test successfully within last 10 years (2016 - 2025).

- Type test certificate should conform the following:
  - Certified (signed and stamped) by the manufacturer / or third party of the material (type test) not from the contractor In English language, printed officially and stamped,
  - Type test certificate shall show the following:
    a. Type of equipment.
    b. Date of issuance of certificate.
    c. All results of test in pass status.

D. <u>The Tenderer shall provide documentation, certified by the owner (Reference List),</u> to show that the **<u>ENERGY METERS AND VOLTAGE SELECTION RELAYS</u>** to be supplied, having the type, model and the same place of manufacture, is supplied to different countries within the last 10 years (2016 - 2025).

- Reference List should conform the following:
  - Certified (signed and stamped) by the manufacturer In English language, printed officially and stamped,
  - Reference List shall show clearly the following:
    a. Name of customer/company where equipment is installed.
    b. Date of issuance.
    c. Rating, capacity of related equipment.

Failure to supply the required qualification documentation (i.e., Type test certificates of equipment, End User Certification & Tenderers qualifications documentation) to the satisfaction of the employer result in rejection of the tender offers.

Section 3

FORMS

FORMS

- **Form of Tender**
- **Form of advance payment guarantee**
- **Form of tender Guarantee**
- **Form of Performance Guarantee**
- **Form of Maintenance Guarantee**
- **Form of Declaration for Prohibited Payments**
- **Form of Declaration for Other Payments**
- **Form of Request for Shipping Release**
- **Form of Inspection Certificate**

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF TENDER

Managing Director
National electric Power Company,
P.O. Box 2310,
Amman, 11181
The Hashemite Kingdom of Jordan.

Dear Sir,

1. Having examined the conditions of contract, Specifications and Schedules for the above Works, we, the undersigned, offer to manufacture, design, engineering, supply of works, and deliver the equipment described in the Specifications and Schedules and in accordance with the said Conditions of the Contract, for the sum of ……
……

   Or such other sum as may be ascertained in accordance with the said Conditions.

2. We agree that this Tender shall be held open for acceptance or rejection for the validity period of **90** days from the date fixed for opening Tenders and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

3. Unless and until a formal Agreement is prepared and executed this Tender, together with your written acceptance thereof, shall constitute a binding Contract between us.

4. If our Tender is accepted, we will deliver to National Electric Power Company a performance Bond, according to clause No.26 instruction to person tendering.

5. We undertake if our Tender is accepted and on receipt of your acceptance to commence and manufacture works, and complete for delivery to Aqaba port the whole of the Works offered within **( ) months.** Calculated from the date of Letter of Award (i.e., commencement date), and to deliver on the dock at Aqaba Port, Jordan the whole of the works offered within a further **( ) months**. (Anyhow all delivery dates will be in accordance with the required completion date of as specified for each substation).

6. We will provide details of the plant and materials to be shipped in good time for the National Electric Power Company to arrange for the Marine Insurance.

7. A Guarantee Period will apply to each section of the Works for (24) months from the date of receipt of last consignment at site or NEPCO warehouse.

8. We understand that you are not bound to accept the lowest or any tender you may receive.

Date this …… day of …… 20 ……

Signature ……in the capacity of ……..

Duly authorised to sign Tender for and on behalf of……..……..

……..…....

Address ……...

Occupation…….

Telephone No:
Fax No. :

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF ADVANCE PAYMENT GUARANTEE

M/S., NATIONAL ELCTRIC POWER COMPANY (NEPCO)

Amman – Jordan

(Contract No.):

At the request of bank… (The Foreign Bank) and on behalf of M/S…(The contractor Name and Address), we the.… (The Local Bank) issue in your favor our irrevocable and Unconditional ***Advance Payment guarantee*** No…...in the amount of (XXXX) (In words).

In this connection we … (**Local bank)** hereby consider ourselves responsible for the unconditional payment to you or your authorized representatives of the above sum on your first Written demand in whole or in part not withstanding any objections on the part of the above named contractor and without any need for notarial warning or judicial proceedings.

This guarantee remains valid from the date of issue till its expiry date on / / then it will be automatically extended for three months, then extending for consecutive periods, and it will not be canceled unless receiving an official letter issued and signed by you.

Bank (Local Bank)

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

Form of Tender Guarantee

M/S., NATIONAL ELCTRIC POWER COMPANY (NEPCO)
Amman – Jordan

(Contract No.) :

WHEREAS (*Name of Tenderer*) (hereinafter called "the Tenderer") has submitted its Tender dated (*date of Tender*) for the performance of the above-named Contract (hereinafter called "the Tender").

At the request of _____ Bank (the *Foreign Bank*) and on behalf of M/S._____ *(the Contractor Name and Address*), we _____(*the Local Bank*) issue in your favour our irrevocable and unconditional Tender Guarantee

No. _____ in the amount of, **JD ---------- (----------** ---------- (i*n words)*).

This guarantee will remain in full force for a period of 90 days from the tender closing date, and any demand in respect thereof must reach the Bank not later than the above date.

Bank (Local Bank)

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF PERFORMANCE GUARANTEE

GUARANTEE NO.

M/S., NATIONAL ELCTRIC POWER COMPANY (NEPCO)
Amman – Jordan

(Contract No.) :

At the request of the Bank… (The Foreign Bank) and on behalf of M/S. (The contractor Name and Address), we ...(The Local Bank) issue in your favor our irrevocable and unconditional performance guarantee No…xxx... In the amount of (XXX) (in words).

In this connection we…. **(local bank)** hereby consider ourselves responsible for the unconditional payment to you or your authorized representatives of the above sum on your first written demand in whole or in part not withstanding any objections on the part of the above named contractor and without any need for notarial warning or judicial proceedings.

This guarantee remains valid from the date of issue till its expiry date on / / then it will be automatically extended for three months, then extending for consecutive periods, and it will not be canceled unless receiving an official letter issued and signed by you.

Bank (Local Bank)

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF MAINTENANCE GUARANTEE

M/S., NATIONAL ELCTRIC POWER COMPANY (NEPCO)

Amman – Jordan

(Contract No.) :

At the request of bank… (The Foreign Bank) and on behalf of M/S…(The contractor Name and Address), we the.… (The Local Bank) issue in your favor our irrevocable and Unconditional ***Maintenance guarantee*** No…...in the amount of (XXXX) (In words).

In this connection we … (**Local bank)** hereby consider ourselves responsible for the unconditional payment to you or your authorized representatives of the above sum on your first Written demand in whole or in part not withstanding any objections on the part of the above named contractor and without any need for notarial warning or judicial proceedings.

This guarantee remains valid from the date of issue till its expiry date on / / then it will be automatically extended for three months, then extending for consecutive periods, and it will not be canceled unless receiving an official letter issued and signed by you.

Bank (Local Bank)

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF DECLARATION FOR PROHIBITED PAYMENTS *

(i) We, the undersigned, ----------
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declare that we have read and comprehended the provisions under Item 14 of General Condition of the Contract related to this Contract and in compliance with this clause; we enclose a declaration properly signed and sealed representing and warranting to The Employer that no direct or indirect commissions, consulting fees, agent fees, Tender fees or other payments, and no inducements or the giving of anything of value (collectively referred to as "Prohibited Payments"), have been made or promised to be made, directly or indirectly, by or on behalf of the Contractor, its sub-Contractor and its or their Employees, agents or representatives, to The Employer, including without limitation any official, employee, agent or representative (whether or not acting in an official capacity) of The Employer, in connection with the solicitation, bidding, negotiation, award or performance of this Contract; and (ii) hereby covenants and agrees that no Prohibited Payments shall be made or promised to be made, directly or indirectly, by or on behalf, of Contractor, its sub-Contracts and its or their employees, agents or representatives, to any official, employee, agent or representative (whether or not acting in an official capacity) of The Employer in connection with the amendment, modification, renewal, extension or performance of this Contract.

Tenderers Name----------
Name of authorized signatory

Signature

Seal ----------

*** The Tenderer is required to submit a declaration for other payments in a separate envelope whether such payments have been paid or not and the offers of all Contractors that do not include such a declaration will be rejected.**

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF DECLARATION FOR OTHER PAYMENTS *

(i) We, the undersigned, ----------
---

declare that we have read and comprehended the provisions under Item 15 of General Condition of the Contract related to this contract and in compliance with this sub-clause; we enclose a declaration properly signed and sealed disclosing any and all direct or indirect commissions, consulting fees, agent fees, tender fees or other payments, or inducements or the giving of anything of value (collectively referred to as "Other Payments") to third parties other than any official, employee, agent or representative (whether or not acting in an official capacity) of The Employer, including without limitation a detailed description of the basis therefore, made or to be made, directly or indirectly, by or on behalf of Contractor, its subcontractors, and its or their employees, agents or representatives, in connection with the solicitation, bidding, negotiation, award or performance of this Contract; and (ii) hereby covenants and agrees promptly to disclose to The Employer in writing the existence of any Third Party Payments including without limitation, a detailed description of the basis therefore, upon the earliest to occur of Contractor making or being obligated to make, any such Third Party Payments.

Contractor's Name

Name of authorized signatory

Signature

Seal ----------

*** The Tenderer is required to submit a declaration for other payments in a separate envelope whether such payments have been paid or not and the offers of all Contractors that do not include such a declaration will be rejected.**

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF REQUEST FOR SHIPPING RELEASE

REQUEST FOR SHIPPING RELEASE

TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

Request No: Date:

To: **National Electric Power company**

Your contract reference:

Our contract reference:

We would be pleased to receive your shipping release.

Manufacturer	Equipment	Qty.	Total No. Of Packages

CONTRACTOR SIGNATURE	RECORD PURPOSE ONLY Local Release No: Date:

Yours faithfully,

* Note : The request must be sent to NEPCO along with the FAT documents.

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

FORM OF INSPECTION CERTIFICATE

INSPECTION CERTIFICATE NO.				
CLIENT	**NATIONAL ELECTRIC POWER COMPANY(NEPCO)**			
PROJECT	**SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT**			
CONTRACT NO.	**16/2026**		**ORDER COMPLETE**	**(YES/NO)**
MAIN CONTRCTOR			**L/C NO.:**	
EMPLOYER	**NEPCO**			
TENDERER				
INSPECTED AT			**DATE OF INSPECTION**	
Routine test by manufacturer not witnessed by NEPCO				
EQUIPMENT/ MATERIAL INSPECTED:				
NUMBER INSPECTED:-				
	According to Annex		**Quantity**	
RESULT OF INSPECTION :				
ATTACHMENTS:				
This is to certify that the Equipment/Material covered by this report has been examined				
in accordance with the relevant specification (s) as well as the drawings and diagrams,				
as appropriately tested and described and found to be in condition stated.				
Approved for Dispatch		**Approved for further Work**		**NOT APPROVED**
Waived Inspection Engineer:		**For and on behalf of**		
		National Electric Power Co.		

SECTION 4

GENERAL CONDITIONS OF CONTRACT

GENERAL CONDITIONS OF CONTRACT

FOR THE SUPPLY AND DELIVERY OF MATERIALS BASED ON

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

PUBLICATION REF.: ME/ 188

GENEVA. MARCH, 1953

1. PREAMBLE:

1.1 These General Conditions shall apply, save as varied by express agreement accepted in writing by both parties.

1.2 Definition Of Terms

The "Purchaser" shall mean the “National Electric Power Company" hereinafter called “NEPCO", and shall include NEPCO legal personal representatives and duly appointed Engineers.

The "Engineer" shall mean the “National Electric Power Company" or persons for the time being or from time to time duly appointed in writing by the purchaser to act as Engineer for the purpose of the Contract.

The words “approved" and” approval" where used in these Conditions or in the specification shall mean "approved by" and “approval of" the purchaser respectively.

The "Vendor" shall mean the "Contractor" whose Tender has been accepted by the Purchaser and shall include the Vendor's (Contractor's") legal personal representatives, successors and permitted assigns.

“F.O.B Price" shall mean the cost of the equipment delivered free on board of the ship or truck or aircraft, all port charges and handling charges (also heavy lift if applicable) included. The Contractor must insure the material against all risks from the time it leaves the works until it is placed F.O.B.

"C&F or CFR Price" shall mean F.O.B. Price plus freight. Including unloading at the port of destination. All Marine Insurance will be effected by the Purchaser. The Contractor must provide full details of the material to be dispatched in good time for NEPCO to arrange for Marine Insurance before the material is actually dispatched.

2. FORMATION OF CONTRACT:

2.1 The Contract shall be deemed to have been entered into when the Purchaser has sent an acceptance in writing before time set in the Tender for acceptance or any such later date extended by the Tenderer at the request of the Purchaser.

2.2 Notwithstanding that the Contract and correspondence in connection with the Contract shall be in the English language, the Contract shall be and be deemed to be Jordanian Contract and shall accordingly be governed by to the laws for the time being in force in the Hashemite Kingdom of Jordan.

2.3 Power To Vary The Work

No alterations, amendments, omissions, additions, suspensions, or variations of the work, (hereinafter referred to as "variations") under the Contract as shown by the Contract Drawings or the Specification shall be made by the Contractor except as directed in writing by the purchaser but the Purchaser shall have full Power, subject to the provision hereinafter contained, from time to time during the execution of the Contract by notice in writing to instruct the Contractor to make such variation without Prejudice to the Contract and the Contractor shall carry out such variations, and be bound by the same Conditions, as far as applicable, as though the said variations occurred in the Specification.

If any suggested variations would, in the opinion of the Contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the Contract, he shall notify the Purchaser thereof in writing, and the Purchaser shall decide forthwith whether or not the same shall be carried out, and if the Purchaser confirms his instructions, the Contractor's obligations and guarantees shall be modified to such an extent as may be justified. The difference in cost, if any, occasioned by any such variations, shall be added to or deducted from the Contract Price as the case may require. The amount of such difference, if any, shall be ascertained and determined in accordance with the rates specified in the Schedule of Prices so far as the same may by applicable, and where the rates are not contained in the said Schedule, or are not applicable, they shall be settled by the Purchaser and the Contractor jointly. But the Purchaser shall not become liable for the payment of any charge in respect of any such variations, unless the instruction for the performance of the same shall have been given in writing by him.

In the event of the Purchaser requiring any variations, such reasonable and proper notice shall be given to the Contractor as will enable him to make his arrangements accordingly, and in cases where goods materials are already prepared, or any designs, drawings, or patterns made or work done that requires to be altered a reasonable sum in respect thereof shall be allowed by the Purchaser.

Provided that no such variation shall, except with the consent in writing of the Contractor, be such as will involve an increase or decrease of the total price payable under the Contract by more than 25 percent thereof.

The power given to the purchaser to make any alteration, amendment, omission, addition or variation to, from or in any part of the works shall include power to vary from time to time the date for the completion of the works or any part thereof.

2.4 Precedence:

In the event of any discrepancy or contradiction between the provisions of the Conditions of Contract and of the Specification, the Conditions of Contract shall take precedence.

2.5 Prices

2.5.1 The Tender calls for firm prices for the definite works.

2.5.2 Provisional items may or may not in whole or in part be purchased by the Purchaser under the Contract.

3. Drawings And Descriptive Documents

3.1 The weights, dimensions, capacities, prices, performance ratings and other data included in catalogues, prospectuses, circulars, advertisements, illustrated matter and price lists constitute an approximate guide.

These data shall not be binding save to the extent that they are by reference expressly included in the Contract.

3.2 Any drawings or technical documents intended for use in the construction of the plant or of part thereof and submitted to the Purchaser prior or subsequent to the formation of the Contract remain the exclusive property of the Vendor. They may not, without the Vendor's consent, be utilized by the Purchaser or copied, reproduced, transmitted or communicated to a third party. Provided, however, that the said plans and documents shall be the property of the Purchaser:

a) If it is expressly so agreed, or.

b) If they are referable to a separate preliminary Development Contract on which no actual construction was to be performed and in which the property of the Vendor in the said plans and documents was not reserved.

3.3 Any drawings or technical documents intended for use in the construction of the plant or of part thereof and submitted to the Vendor by the Purchaser prior or subsequent to the formation of the Contract remain the exclusive property of the purchaser. They may not, without his consent be utilized by the Vendor or copied, reproduced, transmitted or communicated to third party.

3.4 Drawing Guidelines for Contract Drawings

All drawing shall confirm to the following:

1) All drawings are to be prepared on the international sizes as described in BSI BS EN ISO 5457. They are to be of "A" series.

DESIGNATION	SHEET SIZE
A 0	**814 x 1189**
A1	**594x841**
A2	**420x594**
A3	**297x420**
A4	**210x297**

2) The NEPCO title block must be added to all drawings produced for the Contract. The block may be reduced in size, depending on sheet size, The NEPCO drawing number must appear in bottom right hand corner of drawing, the drawings must also include the Contractor's / Consultant's title block adjacent to NEPCO title block.

3) Each drawing to have its own individual number. For schedules, a drawing number to be given and then sheet 1 of x sheets.

4) All descriptive information must be entered in NEPCO title block. All drawings must contain NEPCO drawing numbers as so described and issued by NEPCO.

5) The title block should contain the following:

   1. Revision block as NEPCO requirement.
   2. Name of subject i.e. power station, substation, equipment.
   3. Nature of drawing i.e. site layout, general arrangement, single line diagram.
   4. Any other information or notes.
   5. Dimensions to be in MM or M.
   6. Scale i.e. 1:50, 1:1000.
   7. Contract No. i.e. 16/ 2026
   8. DRG. No. NEPCO drawing numbers that allocated by NEPCO.
   9. Rev. to contain latest revision number.
   10. Title block for Contractor/Consultant.
   11. Graphical bar scales where required, not required for single line diagrams or reinforced concrete details.

6) Drawing sheet should be laid out according to NEPCO requirement.

7) Scales to be in multiples of 1:5, 1:10.

8) All information to be stenciled on drawings, block capital letters should be used throughout. No freehand printing on drawing except for "revision or hold" cloud.

9)
   1. Revisions must be lettered and indicated block provided, all revisions to be checked and approved by Engineer.
   2. Revisions must be interred and highlighted by pencilling cloud around the part revised on the reverse side of the tracing sheet as shown rev. b
   3. Vague descriptions of revisions such as "general revisions" should be avoided. Revisions should be specific. No matter how small the revisions, it should be recorded.

10) Notes, reference drawing, and legends should be recorded on drawing, if key plan and north point is required, then apply NEPCO requirement.

11) Example of drawing title blocks and titles should be submitted to NEPCO for approval before commencement of drawings.

12) On completion of contract, the final drawings submitted to NEPCO are to be marked "as built" dated and signed, The drawings must be accompanied by a complete drawing schedule, listing all the drawings in the order of the NEPCO Numbers. The drawings schedule should be in the region of A3 or A4 size.

4. Packing Of Materials And Shipping Marks:

4.1 All materials, equipment and goods shall be very well packed, in seaworthy containers and/or wooden cases, etc. These should protect the material during shipping, handling, unloading, and for a reasonable period of storage at Aqaba and later storage at NEPCO central stores.

Packing for indoor materials should be done in such a manner as to adequately ensure no ingress of moisture during the shipping and storage periods.

Packing of fragile equipment (e.g. including instruments and porcelain) should be done in a way which ensures a reasonable resistance to impact breakage during transport.

Packing shall in general be adequate and in compliance with the best international practice.

A descriptive and fully itemized list shall be prepared for the contents of each packing case. A copy of this list shall be placed in a waterproof envelope under a metal or other suitable plate securely fastened to the outside of one end of the case, and its position adequately indicated by stenciling on the case. Where appropriate, drawings showing the erection markings of the item concerned shall be placed inside the case.

NEPCO will supply the successful Tenderer with a drawing of its shipping Mark for utilization.

All packing cases, crates, barrels and drums shall remain the property of the purchaser.

5. Inspection And Tests:

5.1 The contractor is required to provide all facilities to enable the employer's representatives (**Two Persons for 5 days excluding traveling days**) to carry out the necessary inspection and testing. The costs of all tests during manufacture and preparation of test records including airfares, hotel accommodations, transport, and all meals are to be borne by the contractor. In case of failure of test all costs of repeated trips of the employer’s representatives will be borne by the contractor. The performance of any such inspections and tests in the presence of the purchaser and /or an independent testing authority does not relieve the contractor from his contractual obligations.

5.2 If as a result of such inspection and checking the purchaser shall be of the opinion that any materials or parts are defective or not in accordance with the contract, he shall state in writing his objections and the reasons therefore.

5.3 Testing instruments shall be approved and shall, if required by the employer's representative, be calibrated by the national physical laboratory or such other body as may be approved, at the expense of the contractor.

5.4 Acceptance tests will be carried out and, unless otherwise agreed, will be made at the vendor's works instruments, if the tests are not specified in the contract, the tests will be carried out in accordance with the general practice obtaining in the appropriate branch of the industry in the country where the plant is manufactured.

5.5 The vendor shall give to the purchaser sufficient notice of the tests to permit the purchaser's representative to attend. If the purchaser is not represented at the tests, the test report shall be communicated by the vendor to the purchaser and shall be accepted as accurate by the purchaser. After completion of the FAT the vendor is required to send complete test report with request for shipping release.

The purchaser will check test report/test results and if accepted a shipping release certificate will be issued within 10 days from the receipt of the report/ shipping release request.

5.6 If on any test (other than a test on site, where tests on site are provided for in the contract) the plant shall be found to be defective or not in accordance with the contract, the vendor shall be with all speed make good the defect or ensure that the plant complies with the contract thereafter, if the purchaser so requires, the test shall be repeated.

5.7 Unless otherwise agreed, the vendor shall bear all the expenses of tests carried out in his works.

5.8 If the contract provides for tests on site, the terms and conditions governing such tests shall be such as may be specially agreed between the parties.

5.9 In case of third party testing the contractor will conduct all required tests by the employer through the appointed third party testing company of the list attached hereto all costs for a/m tests will be incurred by the contractor.

6. Passing Of Risk:

6.1 Save as provided in paragraph 7.6, the time at which the risk shall pass shall be fixed in accordance with the International Rules for the Interpretation of Trade Terms (INCOTERM) of the International Chamber of Commerce in force at the date of the formation of the Contract.

7. Delivery:

7.1 Unless otherwise agreed the delivery period (CFR Aqaba Docks) should be within (8) months from the commencement date (i.e., Letter of Award).

7.2 Should delay in delivery be caused by any of the circumstances mentioned in Clause 10 or by an act or omission of the Purchaser and whether such cause occur before or after the time or extended time for delivery, there shall be granted subject to the provisions of paragraph 7.5 hereof such extension of the delivery period as is reasonable having regard to all the circumstances of the case.

7.3 If a fixed time for delivery is provided for in the Contract and the Vendor fails to deliver within such time or any extension thereof granted under paragraph 2 hereof, the purchaser shall be entitled, on giving to the Vendor within a reasonable time notice in writing, to claim a reduction of the price payable under the Contract. Such reduction shall be calculated at the rate of one half of one percent of that part of the price payable under the Contract which is properly attributable to such portion of the Plant as cannot in consequence of the said failure be put to the use intended for each complete week of delay commencing on the due date of delivery, but shall not exceed a maximum percentage reduction of (15) percent. Such reduction shall be allowed when a payment becomes due on or after delivery. Save as provided in paragraph 7.5 hereof, such reduction of price shall be to the exclusion of any other remedy of the purchaser in respect of the Vendor's failure to deliver as aforesaid.

7.4 If the time for delivery mentioned in the Contract is an estimate only, either party may after the expiration of two thirds of such estimated time require the other party in writing to agree on a fixed time.

Where no time for delivery is mentioned in the Contract, this course shall be open to either party after the expiration of seven months from the formation of the Contract.

If in either case the parties fail to agree, either party may have recourse to arbitration, in accordance with the provisions of Clause 13, to determine a reasonable time for delivery and the time so determined shall be deemed to be the fixed time for delivery provided for in the Contract and paragraph 3 hereof shall apply accordingly.

7.5 If any portion of the plant in respect of which the purchaser has become entitled to the maximum reduction provided for by paragraph 3 hereof, or in respect of which he would have been so entitled had he given the notice referred to therein, remains undelivered, the purchaser may by notice in writing to the vendor require time to deliver and by such last mentioned notice fix a final time for delivery which shall be reasonable taking into account such delay as has already occurred. If for any reason whatever the Vendor fails within such time to do everything that he must do to effect delivery, the purchaser shall be entitled by notice in writing to the Vendor, and without

requiring the consent of any Court, to terminate the Contract in respect of such portion of the plant and thereupon to recover from the vendor any amount not exceeding that part of the price payable under the Contract which is properly attributable to such portion of the plant as could not in consequence of the Vendor's failure e put to the use intended.

7.6 If the purchaser fails to accept delivery on due date he shall nevertheless make any payment conditional in delivery as if the plant had been delivered. The Vendor shall arrange for the storage of the plant at the risk and cost of the purchaser, If required by the purchaser, the Vendor shall insure the plant at the cost of the purchaser, Provided that if the delay in accepting delivery is due to one of the circumstances mentioned in clause 10 and the Vendor is in a position to store it in his premises without prejudice to his business, the cost of storing the plant shall not be borne by the purchaser.

7.7 Unless the failure of the purchaser is due to any of the circumstances mentioned in Clause 9, the Vendor may require the purchaser by notice in writing to accept delivery within a reasonable time.

If the purchaser fails for any reason whatever to do so within such time, the Vendor shall be entitled by notice in writing to the purchaser, and without requiring the consent of any Court, to terminate the Contract in respect of such portion of the plant as is by reason of the failure of the purchaser aforesaid not delivered and thereupon to recover from the purchaser any loss, suffered by reason of such failure up to an amount not exceeding the value of the plant, the delivery of which has not been accepted.

8. Penalty of Delivery Delay:

Penalty equals (0.005) of value of the contract for each complete week on the delay of materials delivery and should not exceed (15%) of the total value of the contract.

9. Terms of Payment:

Subject to any deductions which the purchaser may be authorized to make under the contract, or subject to any additions or deductions provided for under clause 2.3 above, the contractor shall be entitled strictly to payment as follows:-

i. **Ten (10) percent** of contract value as advance payment within sixty (60) days from the Contractor's correct application of payment (invoice) against submitting of the following:

- **A.** Receiving accepted Advance Payment Bank Guarantee in the form given for the same advance payment value and same contract currency.
- **B.** Receiving accepted Performance Guarantee as specified in Instructions to Tenderers.
- **C.** Commercial Invoice or payment request in two originals plus four copies.
- **D.** Interim payment certificate issued and signed by NEPCO in one original and four copies.

ii. **Seventy (70) percent** of contract value as interim payment for shipment of material within sixty (60) days from the Contractor's correct application of payment (invoice) supplemented with the following documents:

A. Commercial Invoice in two originals plus four copies, showing commodity, description, quantity, unit price, total price and delivery base, reference to items as per schedule of prices.

B. Interim payment certificate issued and signed by NEPCO in one original and four copies.

C. Packing list in one original plus four copies.

D. Bill of lading – three negotiables, four non-negotiable.

E. Inspection certificate and / or waived inspection certificate issued and signed by NEPCO (one original) and /or test certificates, two copies and /or shipping release issued and signed by NEPCO – two copies.

F. Certificate of origin in one original and four copies.

G. Vessel certificate less than 15 years old (Certificate).

iii. **Fifteen (15) percent** of contract value as interim payment for receipt at NEPCO's warehouses of material within sixty (60) days from the Contractor's correct application for interim payment (invoice) supplemented with the following documents:

A. Receipt of an invoice or payment request in one original and four copies for the correct amount.

B. Receiving report issued and signed by NEPCO committee as evidence that the material has been received at NEPCO's warehouses in satisfactory condition.

C. Interim payment certificate issued and signed by NEPCO.

iv. **The remaining Five (5) percent** of contract value will be paid against the interim certificate to the Contractor after 60 days from the date of expiring of the maintenance period or (depends on the employer approval) against the submitting of maintenance bond of (5%) of the Contract amount, for the purpose of replacement and\or adjustment of defective material.

Submission of shipping Documents & Invoices:

Shipping documents must be submitted early for clearance purposes.

Shipping documents shall be submitted to the bank if payment made by CAD or LC. If payment is through bank transfer the shipping documents shall be submitted directly to NEPCO as specified.

Shipment:

Shipment by sea freight must be on direct and regular (liner) vessel less than 15 years old at the time of shipment. The vessel shall be classified and certified in accordance with the (ISM) code and shall be a member in the P&I club.

If the Contract has been terminated the claim for termination costs shall be accompanied by:

1) Written justification by Contractor supporting in detail the claimed charge.

2) Either written concurrence by the Employer to the Contractor's claim or a certified copy of an arbitration award.

If the Contractor claims payment for suspension of the works the claim for suspension costs shall be accompanied by:

1) Written justification by the Contractor supporting in detail the claimed charge.

2) Either written concurrence by the Employer to the Contractor's claim or a certified copy of an arbitration award.

8.1 All bank charges, commissions and expenses inside and outside Jordan are to be for the vender account.

8.2 If delivery has been made before payment of the whole sum payable under the contract, plant delivered shall, to the extent permitted by the law of the country where the plant is situated after delivery, remain the property of the vendor until such payment has been effected. If such law does not permit the vendor to retain the property in the plant, the vendor shall be entitled to the benefit of such other rights in respect thereof as such law permits him to retain. The purchaser shall give the vendor every assistance in taking any measures required to protect the vendor's right of property or such other rights as aforesaid.

8.3 A payment conditional on the fulfillment of an obligation by the vendor shall not be due until such obligation has been fulfilled, unless the failure of the vendor is due to an act or omission of the purchaser.

8.4 If the purchaser delays in making any payment, the vendor may postpone the fulfillment of his own obligations until such payment is made, unless the failure of the purchaser is due to an act or omission of the vendor.

8.5 If delay by the purchaser in making any payment is due to one of the circumstances mentioned in clause 10, the vendor shall not be entitled to any interest on the sum due.

8.6 Save as aforesaid, if the purchaser delays in making any payment, the vendor shall on giving to the purchaser within a reasonable time notice in writing be entitled, and without requiring the consent of any court, to terminate the contract and thereupon to recover from the purchaser the amount of his loss up to the value of the plant, the payment for which has been unreasonably delayed.

10. Guarantee:

10.1 Subject as hereinafter set out, the Vendor undertakes to remedy any defect resulting from faulty design, materials or workmanship.

10.2 This liability is limited to defects which appear during the period (hereinafter called the Guarantee period) of **(24) months after receipt of last consignment at site or NEPCO warehouses.**

10.3 In fixing this period due account has been taken of the time normally required for transport as contemplated in the Contract.

10.4 In respect of such parts (whether of the Vendor's own manufacture or not) of the plant as are expressly mentioned in the Contract. The Guarantee Period shall be such other period (if any) as specified in respect of each of such parts.

10.5 In order to be able to avail himself of his rights under this clause the purchaser shall notify the Vendor in writing without delay of any defects that have appeared and shall give him every opportunity of inspecting and remedying them.

10.6 On receipt of such notification the Vendor shall remedy the defect forthwith and at his own expense. Save where the nature of the defect is such that it is appropriate to effect repairs on site, the Purchaser shall return to the Vendor any part in which a defect covered by this Clause has appeared, for repair or replacement by the Vendor, and in such case the delivery to the purchaser of such properly repaired or a part in replacement thereof shall be deemed to be a fulfillment by the Vendor of his obligations under this paragraph in respect of such defective part.

10.7 The guarantee Period is based on the continuous use of the plant in service for 24 hours everyday.

10.8 The Vendor shall bear all the costs and risks of the transport of defective parts or equipment's and their replacements.

10.9 Where, in pursuance of paragraph 7 hereof, repairs are required to be effected on site, the conditions covering the attendance of the Vendor's representatives on site shall be such as may be specially agreed between the parties.

10.10 Defective parts replaced in accordance with this Clause shall be placed at the disposal of the Vendor.

10.11 If the Vendor refuses to fulfil his obligations under this Clause or fails to proceed with due diligence after being required to do so, the purchaser may proceed to do the necessary work at the Vendor's risk and expense.

10.12 The Vendor's liability does not apply to defects arising out of materials provided, or out of a design stipulated, by the purchaser.

10.13 The Vendor's liability shall apply only to defects that appear under the conditions of operation provided for by the Contract and under proper use, it does not cover defects due to causes arising after the risk in the Plant has passed in accordance with Clause 6. In particular it does not cover defects arising form the purchaser's faulty maintenance or erection, or from alterations carried out without the Vendor's consent in writing, or from repairs carried out improperly by the purchaser, nor does it cover normal deterioration.

10.14 Save as in this Clause expressed, the Vendor shall be under no liability in respect of defects after the risk in the plant has passed in accordance with Clause 6, even if such defects are due to causes existing before the risk so passed, It is expressly agreed that the purchaser shall have no claim in respect

of personal injury or of damage to property not the subject matter of the circumstances of the case that the Vendor has been guilty of gross misconduct.

10.15 "Gross misconduct" does not comprise any and every lack of proper care or skill, but means an act or omission on the part of the Vendor implying either a failure to pay due regard to serious consequences which a conscientious contractor would normally foresee as likely to ensure, or a deliberate disregard of any consequences of such act or omission.

10.16 A fresh guarantee period equal to that stated in paragraph 2 hereof shall apply, under the same terms and condition as those application to the original plant, to part supplied in replacement of defective part or to part renewed in pursuance of this clause this provision shall not apply to the remaining part of the plant, the guarantee period of which shall be extended only by a period equal to the period during which the plant is out of action as a result of defect covered by this clause.

11. Relief's:

11.1 The following shall be considered as cases of relief if they intervene after the formation of the Contract and impede its performance. Industrial disputes and any other circumstances (e.g. fire, mobilization, requisition, embargo, currency restrictions, insurrection, shortage of transport, general shortage of materials and restriction in the use of power) when such other circumstances are beyond the control of the parties.

11.2 The party wishing to claim relief by reason of any of the said circumstances shall notify the other party in writing without delay on the intervention and on the cessation thereof.

11.3 The effects of the said circumstances so far as they affect the timely performance of their obligations by the parties, are defined in Clauses 7 and 8. Save as provided in paragraphs 7.5, 7.7., and 8.7, if, by reason of any of the said circumstances, the performance of the Contract within a reasonable time becomes impossible, either party shall be entitled to terminate the Contract by notice in writing to the other party without requiring the consent of any court.

11.4 If the Contract is terminated in accordance with paragraph 3 hereof, the division of the expenses incurred in respect of the Contract shall be determined by agreement between the parties.

11.5 In default of agreement, it shall be determined by the arbitrator which party has been prevented from performing his obligations and that party shall bear the whole of the said expenses. Where the purchaser is required to bear the whole of the expenses and has before termination of the Contract paid to the Vendor more than the amount of the Vendor's expenses, the purchaser shall be entitled to recover the excess.

If the arbitrator determines that both parties have been prevented from performing their obligations, he shall apportion the said expenses between the parties in such manner as to him seems fair and reasonable, having regard to all the circumstances of the case.

11.6 For the purposes of this Clause "expenses" means actual out-of- pocket expenses reasonably incurred, after both parties shall have mitigated their losses as far as possible. Provided that as respects plant delivered to the purchaser the Vendor's expenses shall be deemed to be that part of the price payable under the Contract which is properly attributable thereto.

12. Limitation Of Damages:

12.1 Where either party is liable in damages to the other, these shall not exceed the damage which the party in default could reasonably have foreseen at the time of the formation of the Contract.

12.2 The party who sets up a breach of the Contract shall be under a duty to take all necessary measures to mitigate the loss which has occurred provided that he can do so without unreasonable inconvenience or cost. Should he fails to do so, the party guilty of the breach may claim a reduction in the damages.

13. Rights At Termination:

Termination of the contract, from whatever cause arising, shall be without prejudice to the rights of the parties occurred under the Contract up to the time of termination.

14. Arbitration And Law Applicable:

14.1 If any dispute, question or controversy shall arise between the Purchaser and the Contractor concerning this Contract the matter in dispute shall be referred to an arbitration committee composed of three (3) arbitrators. One arbitrator shall be nominated by the Purchaser and one by the Contractor, and the third arbitrator shall be appointed by both parties.

If either party fails to appoint his arbitrator within one month of the appointment of the arbitrator by the other party, or if the two parties fail to agree on the third arbitrator within two months of the date of the request to refer the dispute to arbitration, such arbitrator shall be appointed by the president of the highest Court in Jordan at the request of either or both parties.

14.2 The decision of the arbitrators shall be final and binding on both the purchaser and the Contractor. Any such reference shall conform to the statutory enactment or regulation governing arbitration's as may be in force in Jordan at the time. The assessment of costs incidental to the reference and award respectively shall be at the discretion of the arbitration committee.

15. Declaration for Prohibited Payments

A - The tenderer shall represent and warrant to The Employer in the Declaration for Prohibited Payments attached to this Tender, that no direct or indirect commissions, consulting fees, Tender fees or other payments, and no inducements or the giving of anything of value, (collectively referred to as "Prohibited Payments"), have been made or promised to be made, directly or indirectly, by or on behalf of the Contractor, its sub-Contractors and its or their employees, agents or representatives, to The Employer including without limitation any official, employee, agent or representative (whether or not acting in an official capacity) of The Employer, in connection with the solicitation, bidding, negotiation, award or performance of this Contract; and hereby covenants and agrees that no Prohibited Payments shall be made or promised to be made, directly or indirectly, by or on behalf of the Contractor, its sub-Contractors and its or their employees, agents or representatives, to any official, employee, agent or representative (whether or not acting in an official capacity) of The Employer in connection with the amendment, modification, renewal, extension or performance of this Contract.

B - In the event of any violation or breach of the provisions of paragraph A of this clause, The Employer at its sole option and discretion shall take all or any of the following Actions: (i) terminate the Contract; and /or (ii) deduct from all or any payments due to the Contractor under this Contract an amount equal to two times the amount of any Prohibited Payment; and/or (iii) demand that the Contractor pay forthwith to the Employer, which demand the Contractor hereby irrevocably agrees to honour, an amount equal to two times the amount of any Prohibited Payment, it being the intention, subject to paragraph D below, that the aggregate of all amounts to which The Employer is entitled under paragraph B shall not exceed the amount which is two times the amount of all Prohibited Payments.

C - The Tenderer agrees that provisions substantially similar (but in no event less restrictive) to paragraphs A and B above shall be incorporated by the Contractor in all agreements with the Contractor's Sub-Contractors, suppliers or contractors arising out of or relating to this Contract, and which provisions shall also expressly provide that the same may, at The Employers sole discretion, be enforced directly by The Employer. The Tenderer further agrees promptly to supply to The Employer true and complete copies of such agreements, forthwith upon entering into by the Contractor of such agreements.

D - The rights and remedies of The Employer under this clause are in addition to and not in derogation of any other rights The Employer may have under applicable law or regulations.

E - This clause shall survive the termination of the Contract.

16. Declaration for other Payments

A- The Tenderer shall fully disclose in the Declaration for Other Payments attached to this Tender any and all direct or indirect commissions, consulting fees, agent fees, tenders fees or other payments, or inducements or the giving of anything of value (collectively referred to as "Other Payments") to third parties other than any official employee, worker, representative or agent of The Employer, including without limitation a detailed description of the basis therefore, made or to be made, directly or indirectly, by or on behalf of the Contractor, its sub-contractors and its or their employees, agents or representatives, in connection with the solicitation, bidding, negotiation, award or performance of this Contract, and hereby covenants and agrees promptly to disclose to The Employer in writing the existence of any Third Party Payments including without limitation, a detailed description of the basis therefore, upon the earliest to occur of the Contractor making or being obligated to make, any such Third Party Payments.

B- In the event of any violation or breach of the provisions of paragraph A of this clause, The Employer at its sole option and discretion shall take all or any of the following Actions: (i) terminate the Contract; and /or (ii) deduct from all or any payments due to the Contractor under this Contract an amount equal to two times the amount of any Third Party Payments; and/or (iii) demand that the Contractor pay forthwith to the Employer, which demand the Contractor hereby irrevocably agrees to honour, an amount equal to two times the amount of any Third Party Payments, it being the intention, subject to paragraph D below, that the aggregate of all amounts to which The Employer is entitled under paragraph B shall not exceed the amount which is two times the amount of all Third Party Payments.

C- The Tenderer agrees that provisions substantially similar (but in no event less restrictive) to paragraphs A and B above shall be incorporated by the Contractor in all agreements with the Contractor's Sub-Contractors, suppliers or Contractor arising out of or relating to this Contract, and shall also expressly provide that the same may, at The Employers sole discretion, be enforced directly by The Employer. The Contractor further agrees promptly to supply to The Employer true and complete copies of such agreements, together with evidence of their inclusion in such agreements, forthwith upon entering into by the Contractor of such agreements.

D- Nothing in this Section shall expressly or impliedly make lawful or permissible any Third Party Payments that are otherwise prohibited under applicable law or regulations. The rights and remedies of The Employer under this clause are in addition to and not in derogation of any other rights The Employer may have under applicable law or regulations.

This clause shall survive the termination of the Contract

17. Force Majeure:

17.1 A Party's failure or delay in performing any of its obligations under this Contract will not be deemed a breach of this Contract to the extent that such failure or delay is directly due to any Force Majeure Event.

17.2 For the purposes of this Clause, "Force Majeure Event" means an event or situation beyond the control of a Party that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of a Party. Such events may include, but are not limited to, acts of a Party in its, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

17.3 If a Force Majeure Event arises, the affected Party shall promptly notify the other Party in writing of such condition and the cause thereof. Unless otherwise directed by the other party in writing, the affected Party shall continue to perform its obligations under the Contract as far as is reasonably practicable, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure Event.

Section 5

Technical Specifications

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

1. - GENERAL CLAUSES:

1.1 - Nature of work

This Specification provides for the design, manufacture, testing in factory, packing for export, supply CFR (C&F - cost and freight) Aqaba-Jordan, setting to work at site and **warranty for a period of 24 calendar months** from the date of receipt the last consignment of **ENERGY METERS & ANCILLARY EQUIPMENT** at site or NEPCO warehouses.

1.2 Overview

NEPCO owns and operates the high voltage electricity transmission system throughout the Hashemite Kingdom of Jordan. In its role as administrator of the financial settlement process for bulk energy transfers throughout the country, NEPCO has amassed an inventory of high accuracy energy meters and associated metering equipment that is used for measuring energy transfers to bulk customers, including distribution companies and international interconnections to Egypt, Syria and Palestine.

NEPCO wants to connect the new supplied meters in this tender to existing remote Automatic Meter Reading system which is integrated directly to its in-house developed billing system.

NEPCO now wishes to invite proposals from suitably qualified companies for the provision of equipment and services covering the following three items:

1. Supply of energy meters and fully equipped meter panels only for substations side.

The supplied Metering system shall ensure a minimum of ten-years operational life without the need for further upgrade or replacement of meters and bidder should supply with certificate form the manufacturers that the spare parts will be available during this period .

It will be important that the successful bidder ensures compatibility between the supplied meters and Head-end, Data Collection software used for remote collection of metering data in NEPCO, noting that **the software used is ZFA-F from ITF/EDV - FROSCHL.**

And this software currently have active drivers for the following NEPCO Existing meters:

ZMQ 202C.8r4af9,E850
ZMD 402CT44.0457,E650
ION 7550 (M7550 A0 E0 B5 E0 A1C)
ION 7500 (P7500 A0 E0 B5 E0 A1C)
M8650C0C0H5C7B0A

If the supplied meters are not form the above-mentioned list, the bidder should provide the suitable driver for the supplied meter.

1.3 Materials List:

Materials supplied as part of this tender includes:

- Energy Meters.
- Voltage Selection Relays (VSR).
- Fully equipped Energy Meter Panels.
- Meter driver for ZFA-F AMR system (if required)

1.4 Services

In support of the materials supply above the following services will also be required:

- FAT at manufacturer site (incl. NEPCO staff travel costs)
- Design Engineering & Drawings (site specific), Manuals for each item.
- Training at manufacturer site (incl. NEPCO staff travel costs & tickets)

1.5 Executive Summary

NEPCO has an automatic meter reading system (AMR) including main, backup and disaster recovery sites, and all the meters in the 400/132/33 KV substations are connected to these 3 systems.

The license of the existing AMR system is up to 5000 meters and currently about 500 meters are covering all NEPCO meters, NEPCO intends to add new metering points to this system for new substations which will be added for the national grid.

And the substations are as follows:

- AAWDCP Main 400/132/33 Kv / IPS (S/S):

in this substation the meters will be installed on 3 feeders (33Kv), so **6 meters** required as main and check meters.

- AAWDCP Main 400/132/33 Kv / BPS01 S/S:

in this substation the meters will be installed on 4 feeders (33Kv), so **8 meters** required as main and check meters.

- AAWDCP Main 400/132/33 Kv / RO South S/S:

This station consists of two 132/33 Kv transformers, the meters will be installed on the 33 Kv side, **4 meters** will be installed as main and check.

- AAWDCP Main 400/132/33 Kv/RO North S/S:

This station consists of two 132/33 Kv transformers, the meters will be installed on the 33 Kv side, **4 meters** will be installed as main and check.

- AQARIYAH (BPS02) S/S (132/11 Kv):

This substation includes of three 132/11 Kv Transformers, and **6 meters** will be installed as main and check meters.

- New QWUEIRA (BPS03) S/S (132/11 Kv):

This substation includes of three 132/11 Kv Transformers, and **6 meters** will be installed as main and check meters.

- TNAIB (BPS04: NCPC) (132/33/11 Kv) S/S:

This substation includes of two 132/11 Kv Transformers, and **4 meters** will be installed as main and check meters.

- TNAIB (BPS04: JEPCO) (132/33/11 Kv) S/S:

This substation includes of three 132/33 Kv Transformers, and **6 meters** will be installed as main and check meters.

- **RE Switching Station (132 Kv):**

This switching station includes of three head lines incoming from G.T for renewable at 132 Kv level so **6 meters** will be installed as main and check meters.

The table below shows the requirements and the required quantities for Each Substation, noting that the final requirements and the required quantities are shown in the Bill of quantities:

Substation Name	Required Meters (Qty)	Required Metering Panels (Qty)	Required Voltage Selection Relays (VSR) (Qty)	Description of metering point
AAWDCP/IPS	6	1	3	3 Feeders 33kV
AAWDCP/BPS01	8	1	4	4 Feeders 33kV
AAWDCP/RO South	4	1	2	2 Transformer 33 Kv
AAWDCP/RO North	4	1	2	2 Transformer 33 Kv
AQARIYAH/ BPS02	6	1	3	3 Transformer 11 Kv
New QWUEIRA/ BPS03	6	1	3	3 Transformer 11 Kv
TNAIB/ BPS04 (NCPC)	4	1	2	2 Transformer 11 Kv
TNAIB/ BPS04 (JEPCO)	6	1	3	3 Transformer 33 Kv
RE Switching Station	6	1	0	3 Transformer 132 Kv
Spare Panel (Fully Equipped)	8	2	4	-
Spare	0	0	19	-
Total Required Quantities	**58**	**11**	**45**	

Table No.1 - Required Quantities From Energy Meters, Metering Panels and Voltage Selection Relays

1.6 Acronyms & Abbreviations

The following list of abbreviation and acronyms are used throughout this document.

Abbreviation	Description
AMR	Automatic Meter Reading
CT	Current Transformer
FAT	Factory Acceptance Test
FTP	File Transfer Protocol
FW	Firewall
GPS	Global Positioning System
HQ	Headquarters
HV	High Voltage
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IPSec	IP Security
kVA	Kilo Volt Ampere
kVAr	Kilo Volt Ampere Reactive
kW	Kilo Watt
L&G	Landis & Gyr
L2/L3	Layer 2 / Layer 3
LAN	Local Area Network
LCD	Liquid Crystal Display
LV	Low Voltage
MCB	Miniature Circuit Breaker
NAT	Network Address Translation

NCC	National Control Centre (at Amman South)
NEPCO	National Electric Power Company
NTP	Network Time Protocol
NTU	Network Termination Unit
PC	Personal Computer
QoS	Quality of Service
RDBMS	Relational Database Management System
Remote Site	Substation
SNMP	Simple Network Management Protocol
SSH	Secure Shell
SSL	Secure Socket Layer
TTB	Test Terminal Block
VT	Voltage Transformer

TABLE NO. 2 - ABBREVIATIONS & ACRONYMS

2.0 Meters and Associated Metering Equipment

This section defines the minimum specification requirements for the new energy meters and other metering equipment as required by NEPCO for this tender.

All required energy meters and metering equipment specified in this tender are to be of the latest technology taking into account international best practice.

It should be noted that no Substation installation services are required by NEPCO at this time.

2.1 Energy Meters:

For the purposes of this tender surface mount energy meters are required but rack mounted meters can be proposed as optional. Where offered these devices shall be technically and functionally to the same specification except for the mounting arrangements. For clarity, the make, model, approvals, etc., shall be the same except for the chassis of the meter. All sub-rack assemblies and other accessories necessary for fixing shall be included in the pricing schedule.

Digital Energy Meters shall be of the latest technology, microprocessor controlled, and capable of measuring all four quadrants in one device i.e. Active energy – import and export, and Reactive energy – import and export.

Main and Check energy meters are required per circuit.

2.2 Applicable Standards & Approvals

Energy meters are to be compliant with all related IEC standards.

The specific requirements for compliance with international standards shall include:

- **IEC 62053-22** – Alternating current static meters for active energy (Class 0.2S and 0.5S)
- **IEC 62053-23** – Alternating current static meters for reactive energy (Class 2 and 3)
- **IEC 62056-21** – Data exchange for meter reading – Direct local data exchange
- **IEC 62052-11** – General requirements, tests and test conditions
- **ISO 17025** – General requirements for the competence of testing and calibration laboratories
- **IEC 62053-31** – Pulse output devices for electromechanical and electronic meters (two wires only)
- **ISO 9001** – Quality management systems
- **ISO 14001** – Environmental management systems
- **IEC 60068-2-1** – Environmental testing
- **IEC 60068-2-2** – Basic environmental testing procedures
- **IEC 60068-2-5** – Basic environmental testing procedures
- **IEC 60068-2-6** – Environmental testing
- **IEC 60068-2-11** – Basic environmental testing procedures
- **IEC 60068-2-27** – Basic environmental testing procedures
- **IEC 60068-2-30** – Basic environmental testing procedures
- **IEC 60068-2-75** – Environmental testing
- **IEC 60085** – Thermal evaluation and classification of electrical insulation
- **IEC 60359** – Electrical and electronic measurement equipment – Expression of performance
- **IEC 60387** – Symbols for alternating-current electricity meters
- **IEC 60417-2** – Graphical symbols for use on equipment
- **IEC 60529** – Degrees of protection provided by enclosures (IP Code)
- **IEC 60695-2-11** – Fire hazard testing
- **IEC 60721-3-3** – Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 3: Stationary use at weather protected locations
- **IEC 61000-4-2** – Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test. Basic EMC publication
- **IEC 61000-4-3** – Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test

- **IEC 60038** – IEC standard voltages
- **IEC 60044-1** – Instrument transformers – Part 1: Current transformers
- **IEC 60044-2** – Instrument transformers – Part 2: Inductive voltage transformers
- **IEC 60050-300** – International Electro technical Vocabulary – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements – Part 312: General terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument
- **IEC 60060-1** – High-voltage test techniques – Part 1: General definitions and test requirements

Meter approvals and certifications shall be from internationally recognized and accredited laboratories only. A copy of each certificate relating to meter approval/compliance shall be included in the bidder's proposal.

2.3Accuracy

For the purposes of this tender, the required accuracy class for all active energy measurement is specified as Class 0.2S, and for reactive energy measurement is specified as Class 2.0.

2.4 Environmental

Energy meters shall function normally in the following conditions:

- Ambient temperature of -5°C to 50°C
- Storage conditions of between 0 and 30°C
- Humidity of 75%

2.5 Electrical:

- **Voltage**

Nominal Voltage U_n:

- Measuring circuitry (from voltage transformer): 3 x 100/120 Volts AC
- Auxiliary circuitry: 1 x 85-240 Volts AC and DC (Universal Auxiliary power supply)
- Maximum voltage U_{max}: 130% U_n

- **Current**

- Nominal current I_n 1Amp
- Maximum current I_{max}: 120% I_n
- Starting current: 0.1% I_n

- **Frequency**

Nominal frequency: 50Hz ±2%

2.6 Others

If the meter auxiliary supply fails, the meter shall automatically switch to the VT input supply voltage and the recording of data shall not be interrupted, (DC) changing automatically to backup supply (AC) is required if the meters does not have internal voltage change over relays.in case that the meter does not have the internal voltage change over relays. Changing automatically to backup supply (AC) is required using external scheme.

Primary values for voltage and current shall be programmable using the configuration software.

Immunity from electrical interference shall be as prescribed in the IEC standards above.

Meters required shall be three-phase, four-wire (3ph 4w), and can be connected in delta.

A Super Cap or lithium battery shall provide backup power for RTC and the storage of register values and configuration data for up to one year without mains power applied.

2.7 Meters Mounting

Energy meters shall be mounted in wall mounted or standard 19" rack mount versions (plus sub-rack and mounting accessories).

Drawings stating the dimensions of meter shall be provided with the tender submission either separately or included in brochures or data sheets (also to be provided with the tender submission).

2.8 Functionality:

2.8.1 Alarms & Events

The following energy meter generated alarms and events are required:

- Internal battery low
- One or more phase failure (programmable threshold level – sampling frequency period to be stated)
- Overvoltage (programmable threshold level – sampling frequency to be stated)
- Meter re-programmed (incl. CT or VT ratio changed and RTC reset)
- Meter last accessed time and date (local and remote)
- Meter error (self test)
- Voltage imbalance (programmable threshold and time delay)

2.8.2 Meter inputs

Energy meters shall have a minimum of two programmable relay inputs in order that externally generated alarms can be reported back to the NCC or to the Head-end, data collection system.

2.8.3 Meter outputs

Energy meters shall have a minimum of three configurable/programmable relay outputs available.

2.8.4 Registers

The following meter registers are required:

- Cumulative energy registers for:
    - Active energy – Import
    - Active energy – Export
    - Reactive energy – Import
    - Reactive energy – Export
- Programmable period (5, 10, 15 and 30 minute) Demand registers for:
    - Active power – Import
    - Active power – Export
    - Reactive power – Import
    - Reactive power – Export
- Five Time of Use registers (Programmable by hour, day, month and season)
- Five Programmable Billing cycle registers (Wh and VArh)

All registers should be programmable to display W, kW, MW, etc.

No multiplication factors shall be allowed.

2.8.5 Storage

Data registers shall have adequate capacity to store three months on site data to allow for any interruptions to the automatic data Collection System, including:

- Demand log (as per above)
- Time of Use registers (Programmable by hour, day, month and season)
- Programmable Billing cycle registers (Wh and VArh)
- Voltage and current for each phase
- Total power factor

Also, to facilitate the storage of data, meters shall be fitted with an internal power supply e.g. battery, which should have a typical life under normal operating conditions of ten years.

2.8.6 Real Time Clock (RTC)

Start and end periods for Daylight Saving Time shall be programmable in the meter once only i.e. should not require re-programming each year.

Adjustment for Daylight Saving shall occur in the meter automatically or as programmed i.e. ability to change automatically every year according to the setting of summer and winter time in the meter. Current Jordanian summer time starts on last Thursday in March at midnight, ending on last Friday in October at 01:00am.

RTC shall not drift beyond second per month.

Energy meters should have local and remote time synchronization capability if the time drift outside acceptable limits the synchronization will be done through the AMR server(s).

2.9 Meter Auxiliary Supplies

In case of meter Auxiliary Supplies failure, and to ensure continuity of remote data collection, and meter operation (and the transmission of alarms and events), the new energy meters are specified to include the facility for feed the meter from voltage transformer secondary supply using electronics within the meter.

These auxiliary supplies shall normally be taken from the 110V DC battery within each Substation, but when fail, change-over to the VT input supply voltage.

2.10 Communications

2.10.1 Protocols

- Energy meters should preferably use a communications protocol that is based on an open, industry recognized standard e.g. DLMS. Meters purchased will be required to integrate to the Head-end, data collection system, and it is a condition of this tender that the bidder ensures that this is possible.

- **Optional features**:

  The cost of optional features shall be mentioned separately in the BoQ:

  1- Meters may also be specified as IEC 61850 compatible for future Smart Grid integration.

  2- Also another option is required to allow meters connection to SCADA 101& 104 as an optional feature.

2.10.2 Remote

The TCP/IP over Ethernet communications can be either built-in type or as an internal module and the physical connectivity shall be via RJ45 socket.

Energy meters shall have an RS-485 output as well as an RJ45 output from the Ethernet communications module.

2.10.3 Local

Local communications for meter reading and configuration purposes shall be possible via an optical port located on the front of the meter or by direct connection port.

For calibration purposes, the optical port shall also be capable of providing a suitable output pulse to calibration equipment for both active (W) and reactive (VAr) power.

All accessories to communicate with the meter shall also be supplied.

2.11 Configuration Software(s)

Meter configuration software shall be provided to enable local and full remote (via the data network without the necessity to operate any hardware for the meters locally) programming of, but not limited to, the following:

- Measurement transformer ratios
- Measurement transformer compensation
- Time and date
- Demand period duration
- Display sequence
- Time of Use registers
- Billing period

A minimum of four test points from the combined error of the current transformer and voltage transformer should be capable of being programmed in the meter.

The configuration software shall run on a Microsoft Windows environment and be compatible with a laptop computer (to be specified by the bidder – max. 15-inch screen).

The laptop quoted shall be capable of supporting multiple configuration software packages for meters of different models and manufacturers.

NECPO will carry out all energy meter programming related to CT and VT information.

2.12 Labelling

Meters shall be marked “The Property of National Electric Power Company” and shall be individually serial numbered according to NEPCO approved format Circuit names (and Main/Check designation) shall also be labeled on the front of the meters (NEPCO will provide these labels following contract award).

Primary and secondary values for voltage and current shall also be displayed on the meter nameplate as well as the circuit name (these will be supplied by NEPCO).

2.13 Security

Configuration of the meter shall be controlled through appropriate multiple level password protected access – to be defined by the bidder.

Meter cover and terminal cover shall have appropriate facilities for the application of a wire (or similar) security seal.

2.14 Warranty

Energy meters supplied shall have a minimum warranty for 24 months from the date of receipt of last consignment at site or NEPCO warehouses.

2.15 Literature

Brochures and data sheets shall be supplied with the tender submission (in hard copy and soft copy version provided on CD/DVD or similar).

One bound copy hard copy version and one of soft copy version (provided on CD/DVD or similar) of the Operation and Maintenance manuals shall also be quoted as part of the training package offered.

Spare parts or other accessories shall also be stated in the literature provided by the bidder.

All documents should be presented in English.

2.16 Spare Parts

Bidder shall state all recommended spare parts required for the energy meters.

Spare parts shall be included in the bidder's proposal and shall typically constitute as shown in the BoQ tables.

3. Metering Panels:

3.1 Schematic Arrangement

Meter panels shall meet the requirements as shown in Figure 1 below. A maximum of four circuits can be arranged per panel.

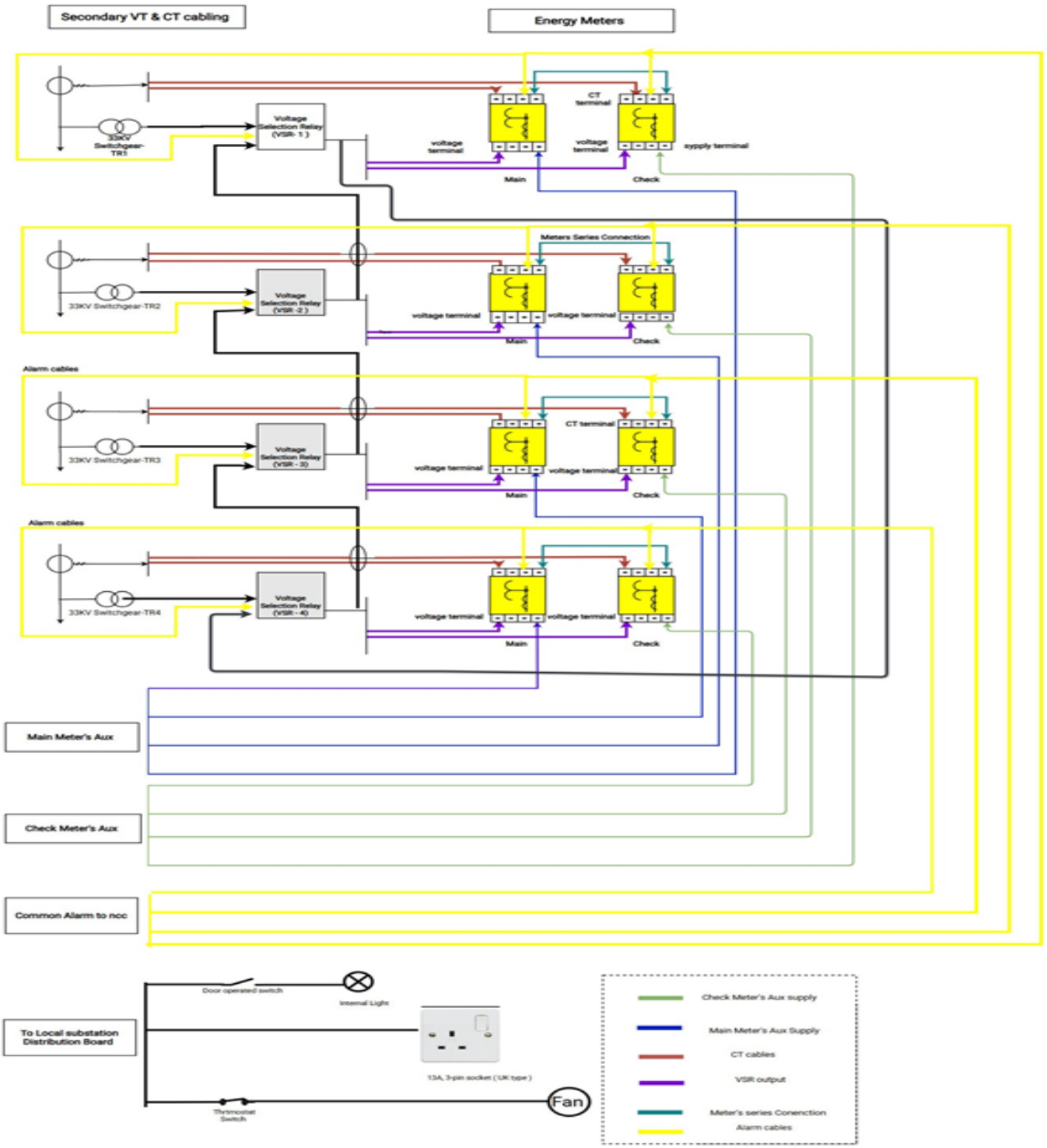


Figure 1 - Meter Panel Schematic (4 Circuits)

Detailed descriptions and diagrams for testing facilities are contained later in this document.

3.2 Construction

Meter panel carcass shall be constructed from 1.5mm sheet steel and painted with primer then undercoat, and finished in **paint code RAL 6019**.

Completed panels shall be package to a suitable level of protection for sea freight shipping to ensure no damage occurs in transit.

A minimum of four floor-fixing points shall be pre-drilled and available in the base of the cabinet.

Gland plates suitable for a range of cable sizes shall be included at the base of the cabinet.

Cabinets shall be (80-85 W x 60 D x 200-225 H) cm, and rack type with transparent (shatter proof plastic) single front door hinged on the right hand side. Rear opening shall be by two equally sized sheet steel doors with locking facility incorporated into the handle.

The meters shall be mounting on swing frame hinged on the left side to allow easy access for replacing Energy meters and VSR, as shown in Appendix C and the final arrangement shall be Approved by NEPCO during the design stage.

Appropriate lifting eyes shall be fitted on the top of the panel and should withstand the additional weight of eight energy meters.

Cabinets shall be fitted with a thermostatically controlled fan for cooling purposes.

Cabinets shall be fitted with an internal light source that is switched on/off when opening and closing the rear doors.

Cabinets shall be fitted with a standard 13 Amp power socket.

Bidders to submit General Arrangements and Wiring Diagrams of cabinet design proposed to be approved by NEPCO.

Meter panels shall be tested to a protection level of IP52.

An earthing bar shall also be included.

The panels should be fully wired and fully equipped with the components as shown in table No.1 and the related accessories.

3.3 Wiring

Panels shall be wired for the number of circuits/meters as described in the bill of quantities section.

All panel wiring to be suitable for power and data signals as appropriate.

All panel wiring shall be:

- Multi-stranded
- Colour coded according to phase colour (R,Y,B).
- Minimum cross sectional area of 2.5mm^2 for CT, VT and aux supplies circuits
- The Auxiliary supply for the meters shall be chosen from 2 different sources, the main meters shall be fed from station 110 DC, while the check meters supplied from essential supply 230 AC.

Wires shall not be terminated without crimps.

Wires ferrules should be supplied and approved by NEPCO for all panels.

Factory test certificates for all wiring checks e.g. point-to-point and continuity tests, shall be included.

Power and data cables shall be suitably separated inside the cabinet.

3.4 Accessories

All Meter Panels shall come fully equipped with the following:

- One 13Amp power socket (UK type 3 square pins)
- One cooling fan with variable setting temperature controlled switch
- Internal lamp suitable for providing adequate light for working conditions, with door activated switch
- DIN Rail and terminal blocks with appropriate isolation features and test point and earthing facilities
- 10% spare terminals to be included
- MCBs for incoming VT and power isolation with alarm contacts
- Document/drawing storage pockets on the inside of the rear doors
- All wiring to be enclosed in trunking with power and data cables separated
- Engraved circuit labelling above each pair of meters (details to be provided by NEPCO)
- Open/close links for VT circuits and open/close shorting links for CT circuits (as Appendix **A – Open/close link type for use on VT and CT circuits**).

4. Voltage Selection Scheme:

4.1 General

In order to prevent the loss of energy measurement due to the failure of a voltage transformer secondary supplying any one or more measuring circuits of an energy meter, a voltage selection scheme shall be employed.

Voltage selection schemes shall be configured to switch from the designated voltage transformer secondary circuit to an alternative voltage transformer secondary (typically of a similar, adjacent circuit) should a single, or multiple phase failure occur.

Upon operation of the voltage selection scheme, an auxiliary contact shall be available which can be used as an alarm output and may be used to indicate that a failure has occurred.

Voltage Selection Schemes shall be included within the meter panel and follow the schematic diagram in Appendix B – Voltage Selection Relay.

The Voltage Selection Schemes proposed, in addition to the above, shall suit the specific requirements of each substation and be subject to NEPCO approval.

Discreet auxiliary relays are not deemed an acceptable solution for providing voltage selection, and as such shall not be proposed by the bidder, the required is a phase failure and voltage selection inside one reliable main relay, the VSR relay shall be equipped with a

facility to choose the percentage to switch the operation from preferred to alternative supply with a suitable time delay.

To facilitate maintenance to the voltage selection Scheme and avoid any disconnection during normal operation, it's required to add facility using two Sets of terminal to bypass all the selection relays easily by open and close few links to keep each circuit only supplied by its own voltage during maintenance of voltage selection scheme.

- **The Applicable voltage selection scheme shall be achieving the below functionality:**

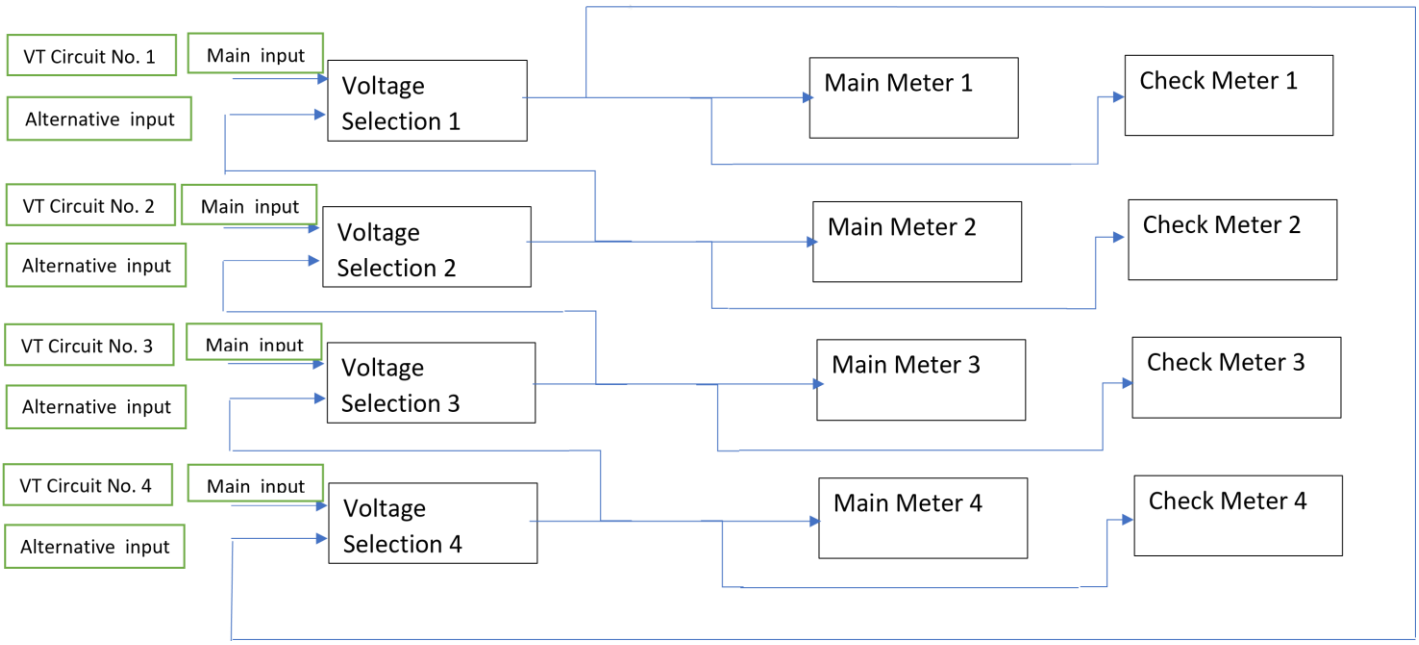


Figure (2) Voltage Selection Diagram schematic diagram

4.2 Technical Specification

Applicable Standards

The specific requirements for compliance with international standards shall include:

- **Insulation class:**
  - IEC 601010-1: 1990/A2: 2001 Class I
  - EN 61010-1: 2001 Class I
- **Insulation Category (Overvoltage):**
  - IEC 601010-1: 1990/A2: 1995 Category III
  - EN 61010-1: 2001 Category III
- **Environment:**
  - IEC 601010-1: 1990/A2: 1995 Pollution degree 2
  - EN 61010-1: 2001 Pollution degree 2
- **Product Safety:**
  - 72/23/EEC
  - EN 61010-1: 2001
  - EN 60950-1: 2002

- **Environmental**

  The Voltage Selection Relay shall function normally in the following conditions:

  - Ambient temperature of -5°C to 50°C
  - Storage conditions of between 0 and 30°C
  - Humidity of 75%.

- **Electrical**

  From voltage transformer secondary: 110Volts ac

  System frequency: 50Hz

5. Inspection and Factory Acceptance Test (FAT):

- **The FAT shall include testing the Energy meters, metering Panels and voltage selection relays and shall carried out at Manufacturer sites**.

- The contractor is required to provide all facilities to enable the employer's representatives (**Two Persons for 5 days excluding traveling days**) to carry out the necessary inspection and testing. The costs of all tests during manufacture and preparation of test records including airfares, hotel accommodations, transport, and all meals are to be borne by the contractor. In case of failure of test all costs of repeated trips of the employer's representatives will be borne by the contractor. The performance of any such inspections and tests in the presence of the purchaser and /or an independent testing authority does not relieve the contractor from his contractual obligations.

  Testing shall have the objective to verify compliance with the latest version of IEC standards as specified in this tender. The bidder shall submit with his proposal, a pro-forma of suggested tests to meet this requirement.

  The bidder in response to this tender shall submit standard pro-forma containing a schedule of tests to satisfy the requirements of FAT.

  The Contractor shall carry out the tests stated in accordance with the conditions of this Specification and, without extra charge, such additional tests as in the opinion of the Engineer are necessary to determine that the Contract Works comply with this Specification under either test (in manufacturer's works, on the Site or elsewhere) or ordinary working conditions.

  Type tests may be omitted at the discretion of the Engineer if satisfactory evidence is given that tests already made.

  All materials used shall be subjected to and shall withstand satisfactorily such routine tests as are customary in the manufacture of the types of plant included in the Contract Works.

  All tests shall be carried out to the Satisfaction of the Engineer and in his presence, at such reasonable times as he may require, unless agreed otherwise.

  Not less than 30 days notice of all tests shall be given to the Engineer in order that he may be represented if he so desires. Failure of the Contractor to give such notice which results in a delay in the completion of the tests cannot be used by the

Contractor as a reason for failure to meet the overall completion date and any extra costs incurred by the Contractor are not recoverable. As many tests as possible shall be arranged together. Three copies of the Contractor's record of tests shall be supplied to the Engineer.

Measuring apparatus shall be approved by the Engineer and if required shall be calibrated at the expense of the contractor at an approved laboratory.

The Contractor shall be responsible for the proper testing of the work completed or plant or materials supplied by a sub-contractor to the same extent as if the work, plant or materials were completed or supplied by the Contractor himself.

All apparatus, instruments and connections required for the above tests shall be provided by the Contractor but the Employer will permit the Contractor to use for the tests on site any instruments and apparatus which may be provided permanently on site subject to the operation of the system and the carrying out of other Contracts and conditional upon the Contractor accepting liability for any damage which may be sustained by the Employer's equipment during the test.

The Employer is responsible to provide on-site electrical energy for the purpose of approved preliminary tests and for the official tests.

Any costs incurred by the Employer or the Engineer in connection with inspection and re-testing as a result of a failure of the subject under test, shall be to the account of the Contractor.

No inspection or lack of inspection or passing by the Engineer of work, plant or materials, whether carried out or supplied by the Contractor or sub-contractor, shall relieve the Contractor from his liability to complete the Contract Works in accordance with the Contract or exonerate him from any of his guarantees.

- Every facility is to be provided by the Contractor to enable the Employer’s representatives to carry out the necessary inspection and testing of the purchased materials. The costs of all tests during manufacturing and preparation of test records shall be borne by the Contractor.

  Instruments shall be approved and shall, if required by the Employer's representative, be calibrated by the National physical Laboratory or such other body as may be approved at the expense of the contractor.

- **<u>Type Tests</u>**:

All Type test reports for Energy meters and ancillary equipment should be in accordance to latest IEC standards or such other standards as may be approved.

Type tests may be omitted at the discretion of the Engineer if the Tenderer provided documentation, certified by the owner (Type Test), to show that the ENERGY METERS & ANCILLATY EQUIPMENT to be supplied, having similar type or above and the same place of manufacture, passed the type test successfully within last 10 years (2016 - 2025).

- **Routine Tests**:

1. **The FAT (Routine Tests) shall include testing the Energy meters and fully equipped metering Panels including the voltage selection relays**.
2. Routine tests shall be carried out in presence & witness of FAT Tests by NEPCO Employer's inspectors.
3. All Routine tests during FAT for Energy meters and ancillary equipment shall be carried out according to the latest IEC standard or such other standards as may be approved and shall at least include the following:

- **Energy Meters Routine Tests:**

1) Physical Verification.

2) Creepage and Clearance.

3) Insulation and Dielectric Test

- Insulation Resistance Measurement.

- AC High Voltage (HI potential) Test.

- Impulse Voltage Test.

4) Accuracy and Calibration Tests

- Accuracy Test Calibration

- No-Load Condition Test.

- Starting Current Test.

- Meter Constant Test.

5) Meter Functional Test.

- **Metering Panels Routine Tests:**

1) Insulation Resistance Test.
2) Dielectric / HV Test.
3) Continuity & Grounding.
4) Functional / Operational Test.
5) Visual Inspection and final assembly check.

6. Meters configuration Training Course:

- **The Meters configuration Training Course shall be carried out at Manufacturer site.**

- The contractor is required to provide all facilities to enable the employer's representatives (**Two Persons for 4 days excluding travelling days**) to carry out the necessary training course. The costs of all training course including airfares, hotel accommodations, transport, and all meals are to be borne by the contractor.
- Not less than 30 days notice of training course date shall be given to NEPCO Engineer in order that he may be ready and represented.
- **The Meters configuration Training Course at least shall include the following:**

  - Configuration of primary for CT and VT and find the calibration Pulser led for meters testing purposes.

  - Testing the Energy meters, calibration and accuracy test.

  - Changing the resolution of meter registers and Instantaneous readings.

  - Activating Test Mode on the meter.

  - Configuration Alarms in the meter and connection with Alarm fascia in the stations.

  - Configuring energy registers in the meters.

  - Configuring meter Load profiles.

  - Configuring Event Log.

  - Creating meter Screens and link with meter registers and Instantaneous values.

  - DST Configuration.

  - Time of use Seasons and how to apply new tariff at pre-defined dates.

  - Control Tariff internally and externally using control Signals from NCC.

  - Configuring meter relays to control Circuit breakers.

  - Meter Cyber Security and hardware protection.

  - Losses Calculation for transforms and compensation for Transmission lines, Current Transformers, and Voltage Transforms.

  - Communication meter Configuration for all the available meter ports and multi connection for different Utilities' concurrently.

  - Exporting the meter stored data to different formats, such as Excel, PDF,xml, ….).

  - Energy meter Different Protocols such as DLMS, Modbus, IEC, 61850, DNP3, …).

  - Connection with meter protocol converters and connection with multi Systems.

  - Connection of Energy meters with SCADA Systems.

7. Extent of work

The Contract Works to be supplied shall include all work incidental thereto whether specified in detail or not and in general is to be carried out by the Contractor in accordance with the Conditions of Contract and shall comprise the following: -

7.1 - Definite work. The design, manufacture, testing in factory, supply CFR Aqaba, setting to work in accordance with the Conditions of Contract and this Specification at the prices stated in the Schedules, on the following basis: -

Work at fixed schedule prices. The ENERGY METERS & ANCILLARY EQUIPMENT items of which the numbers, quantities and details are specified in the Schedules, the type(s), voltage and rating(s) as described and of which particulars of the detailed equipment are given, such equipment including all accessories.

7.2 - Work at the option of the Employer. This shall include but not be limited to:

i. **Spare apparatus and materials**. The manufacture, testing, supply CFR Aqaba may require in accordance with the Conditions of Contract at the prices stated in the Schedules, of such quantities of the apparatus and materials enumerated and such repeats (if any) thereof as the Employer shall order from the Contractor at any time before the expiration of the Defects Notification Period of the Definite Work.

ii. **Tools and appliances.** The supply CFR Aqaba may require in accordance with the Conditions of Contract at the prices stated in the Schedules, of such quantities of the apparatus enumerated and such repeats (if any) thereof as the Employer shall order from the Contractor at any time before the expiration of the Defect Notification Period of the Definite Work.

Each separate order for Work at the Option of the Employer shall constitute a Section for the purpose of payment and taking over.

7.3 - Site Access

Aqaba, Jordan's only seaport can be reached by sea via the Red Sea and the Straits of Tiron. Amman can be reached by road from Aqaba or by air directly from Europe and other countries.

Access to all substation sites is available by existing roads. Rail access is not available at these sites.

7.4 - General particulars and guarantees

The Contract Works shall comply with the general particulars and guarantees specified in the Schedules.

All plants and apparatus supplied under this Contract shall be to approval.

The Contractor shall be responsible for any discrepancies, errors or omissions in the particulars and guarantees, whether or not such particulars and guarantees have been approved by the Engineer.

7.5 - Compliance with Specification

Notwithstanding any description, drawings or illustrations which may have been submitted with the tender, all details other than those shown in the Schedule of Departures from the Specification will be deemed to be in accordance with the Specification and the standard specifications and codes referred to therein.

No departures from the Specification, except those shown in the Schedule of Departures and approved by the Employer, shall be made without the written approval of the Engineer.

7.6 - Variance with Conditions of Contract

In the event of there being any inconsistency between the provisions of this Specification and the Conditions of Contract, the provisions of the Conditions of Contract shall prevail and shall be considered as incorporated in the Contract.

7.7 – Quality Assurance

Samples of all materials used shall be taken and tests performed to ensure compliance with the specifications. All test results shall be recorded and test certificates supplied as required. Samples of materials and workmanship shall be provided to the Engineer from manufacturers as required.

All records shall be kept available for inspection by the Engineer

7.8 - Places of manufacture

The manufacturer and places of manufacture, testing and inspection of the various portions of the Contract Works shall be stated in the Schedules.

7.9 - Sub-contracts

The Contractor shall supply three copies of all orders placed with sub-contractors. Information is to be given on each sub-order sufficient to identify the material or equipment to which the sub-order relates and to notify the sub-contractor that the conditions of the Specification apply.

7.10 - Dates for completion

The dates of readiness for inspection and testing, access to site(s), delivery and completion of the various Sections of the Contract Works shall be as stated in the Schedules.

7.11 - Access to manufacturer's works

Access to the Contractor's and sub-contractor's works shall be granted to the representatives of the Engineer for the purpose of inspection, testing and ascertaining progress.

7.12 - Programme, progress reports and meetings

The Contractor shall submit for approval within 1 month of the starting date four copies of an outline production and delivery chart. Within a further period of one month the Contractor shall provide four copies of a detailed programme in a form to be specified by the Engineer showing plant manufacture and delivery; this programme shall also include details of drawing submission and circuit outage requirements.

The Contract Works of this Specification shall be incorporated in the supply systems with the minimum of interruption of supply and the Contractor shall arrange his Programme of Work, in conjunction with the Engineer, to obtain maximum availability of plant at all times.

If at any time during the execution of the Contract it is found necessary to modify the approved chart, the Contractor shall inform the Engineer and submit a modified chart for approval. Such approval shall not be deemed to be consent to any amendment of the completion date stated in the Schedules.

At monthly intervals after approval of the programme chart the Contractor shall submit to the Engineer three copies of written detailed progress reports in an approved form, indicating the stage reached in the design, ordering of material, manufacture and delivery of all components of plant.

The progress reports shall include good quality colour photographs of approximately half-plate size to show details of the required equipment. A minimum of ten photographs shall be incorporated.

If during execution of the Contract the Engineer considers the progress position of any section of the work to be unsatisfactory, he will be at liberty to call such meetings, either at the Amman Office or at Site, as deemed to be necessary. If required by the Engineer a responsible representative from the Contractor's works shall attend such meetings.

7.13 - Language and system of units

The English language shall be used in all written communications between the Employer the Engineer and the Contractor with respect to the services to be rendered and with respect to all documents and drawings procured or prepared by the Contractor pertaining to the work, unless otherwise agreed by the Engineer.

It is required that all equipment labels or plates and the Operating and Maintenance Instructions be written in English.

The design features of all equipment shall be based on the SI system of units.

7.14 – Drawings and models

A list of the drawings attached to the Specification is given in the Schedules.

A list of the drawings and models (if any) to be submitted by the Contractor with his Tender and a list of drawings, and models (if any) to be submitted after the Commencement Date, are also given in the Schedules. The Contractor shall also provide free of charge any additional drawings and/or copies of any drawing required by the Engineer.

The Contractor shall submit all drawings and models for approval, a period of Four weeks from receipt of the drawings by the engineer shall be allowed in the program for checking and permit modifications to be made if such are deemed necessary, and the drawings and models to be re-submitted without delaying the initial deliveries or completion of the Contract Works.

Three copies of all drawings shall be submitted for approval and three copies of any subsequent revision. Following approval, four further copies will be required for distribution to the Employer and to site for installation.

All dimensions marked on the drawings shall be considered correct although measurement by scale may differ therefrom. Detailed drawings shall be worked to where they differ from general arrangement drawings.

All detailed drawings submitted for approval shall be to scale not less than 1:20. All important dimensions shall be given and the material of which each part is to be constructed shall be indicated.

Drawings and models submitted by the Contractor and approved by the Engineer shall not be departed from without the instruction in writing of the Engineer.

The Contractor shall be responsible for any discrepancies or errors in or omissions from the drawings, whether such drawings have been approved or not by the Engineer. **Approval given by the Engineer to any drawing shall neither relieve the Contractor from his liability to complete the Contract Works in accordance with this Specification and the Conditions of Contract nor exonerate him from any of his guarantees.**

If the Contractor needs urgent approval of any drawing in order to avoid delay in the completion of the Contract Works, he shall advise the Engineer to such effect when submitting the drawings.

All drawings and models shall be submitted in accordance with the provisions of this Specification and shall become the property of the Employer.

7.15 – Operating and maintenance instructions

When the general arrangements and details of the ENERGY METERS have been finalised and not later than three months before erection commences, the contractor shall submit to the Engineer for approval a fully detailed operating and maintenance instruction manual.

The details shall cover all associated ancillary equipment as supplied under the contract. It will not be sufficient to incorporate manufacturer's standard brochures as part of the text unless they refer particularly to the equipment supplied and are free of extraneous matter.

The information provided should include essential flow and circuit diagrams, pipe works general arrangement and detailed drawings of the installation, make mention of special materials were used and include schedules of lubricants, diagrams should be reduced to a convenient size and bound into the volume and not inserted into cover pockets.

If the complete text of the manual is unduly bulky, then this shall be appropriately sub-divided and produced in multi – volume form. When approved three copies of the complete text, diagrams and drawings as made up

in the draft form shall be handed to the Engineer for use during erection commences.

7.16 - Compliance with regulations

All apparatus and material supplied, and all work carried out shall comply in all respects with such of the requirements of the Regulations and Acts in force in the country of the Employer as are applicable to the Contract Works and with any other applicable regulations to which the Employer is subject.

7.17 - Fire precaution

All apparatus, connections and cabling shall be designed and arranged to minimize the risk of fire and any damage which might be caused in the event of fire.

7.18- Packing, shipping and transport

The Contractor shall be responsible for the packing, loading and transport of the plant from the place of manufacture, whether this is at his own works or those of any supplier, to CFR Aqaba –Jordan.

All apparatus shall be carefully packed for transport by sea, rail and road as necessary and in such a manner that it is protected against climatic conditions.

Where oil for the first filling is to be provided it shall be supplied in non-returnable drums.

Precautions shall be taken to protect parts containing electrical insulation against the ingress of moisture.

All bright parts liable to rust shall receive a coat of anti-rusting composition and shall be suitably protected. The machined face of all flanges shall be protected by means of a blank disc bolted to each face.

Where appropriate all parts shall be boxed in substantial crates or containers to facilitate handling in a safe and secure manner. Each crate or container shall be marked clearly on the outside of the case to show where the mass is bearing and the correct position for the slings. Each crate or container shall also be marked with the notation of the part or parts contained therein, contract number and port of destination, and shall become the property of the Employer after delivery.

The Engineer may require to inspect and approve the packing before the items are dispatched but the Contractor shall be entirely responsible for ensuring that the packing is suitable for transit and such inspection will not exonerate the contractor from any loss or damage due to faulty packing.

Any damage due to defective or insufficient packing shall be made good by the Contractor at his own expense and within reasonable time when called upon by the Employer to do so. Three copies of complete packing lists showing the number, size, marks, mass and contents of each package shall be posted to the Engineer immediately the material is dispatched.

The Contractor shall inform himself fully as to all relevant transport facilities and requirements and loading gauges and ensure that the equipment as packed for transport shall conform to these limitations.

7.19 – Contractors Responsibilities

Unless stated specifically to the contrary in the tender with full supporting explanations the Contractor will be deemed to have concurred as a practical manufacturer with the design and layout of the works as being sufficient to ensure reliability and safety in operation freedom from undue stresses and working plant.

The contractor shall include the whole of the works, which are described in or implied by the contract document. **All matters omitted from the contract document, which may be inferred to be obviously necessary for the efficiency, stability and completion of the work shall be deemed to be included in the contract price**.

Works shown upon the drawings and not mentioned or described in the specification and works described in the specification and not shown on the drawings will nevertheless be held to be included in this contract and their execution shall be covered by the contract price in the same manner if they had been expressly shown upon the drawings and described in the specification.

The Engineer will set out a datum line from which the contractor on his own responsibility shall duly set out all other works but under the direction and to the satisfaction of the Engineer and according to the drawings supplied or approved by the Engineer.

7.20 - Design and standardization

The Contract works shall be designed to facilitate inspection, cleaning and repairs, and for operation where continuity of supply is the first consideration. All apparatus shall also be designed to ensure satisfactory operation in all atmospheric conditions prevailing at the Site(s) and during such sudden variation of load and voltage as may be met with under working conditions on the system, including those due to faulty synchronising and short circuit.

The design shall incorporate all reasonable precautions and provision for the safety of those concerned in the operation and maintenance of the Contract Works and of associated works supplied under other contracts.

Cubicles and similar enclosed compartments shall be adequately ventilated to restrict condensation. All contactor or relay coils and other parts shall be suitably protected against corrosion.

All apparatus shall be designed to avoid the risk of accidental short circuit due to animals, birds, insects, mites, rodents or micro-organisms.

Corresponding parts shall be interchangeable. Where required by the Engineer the Contractor shall demonstrate this quality.

Fully detailed specifications and materials of several parts of the plants are to be submitted describing particularly the materials to be used.

All equipment is to operate without undue vibration and with the least possible amount of noise and is not to cause a nuisance.

7.21 - Topicalization

In choosing materials and their finishes, due regard shall be given to the humid tropical conditions under which equipment is to work, and the recommendations of British Standard Code of Practice 1014 or equivalent should be observed unless otherwise approved. Some relaxation of the following provisions may be permitted where equipment is hermetically sealed but it is preferred that tropical grade materials should be used wherever possible: -

a. Metals. Iron and steel shall generally be painted or galvanised as appropriate. Indoor parts may alternatively have chromium or copper-nickel plated or other approved protective finish. Small iron and steel parts (other than rustless steel) of all instruments and electrical equipment, the cores of electromagnets and the metal parts of relays and mechanisms shall be treated in an approved manner to prevent rusting. Cores, etc., which are built up of laminations or cannot for any other reason be anti-rust treated, shall have all exposed parts thoroughly cleaned and heavily enamelled, lacquered or compounded.

   When it is necessary to use dissimilar metals in contact, these should, if possible, so be selected that the potential difference between them in the electrochemical series is not greater than 0.5 volts. If this is not possible, the contact surfaces of one or both of the metals shall be electroplated or otherwise finished in such a manner that the potential difference is reduced to within the required limits, or if practicable, the two metals shall be insulated from each other by an approved insulating material or a coating of approved varnish compound.

b. Screws, nuts, springs pivots, etc. The use of iron and steel is to be avoided in instruments and electrical relays wherever possible. Steel screws, when used, shall be zinc, cadmium or chromium plated, or when plating is not possible owing to tolerance limitations, shall be of corrosion-resisting steel.

   All wood screws shall be of dull nickel-plated brass or of other approved finish. Instrument screws (except those forming part of a magnetic circuit) shall be of brass or bronze. Springs shall be of non-rusting material, e.g., phosphor-bronze or nickel silver, as fast as possible. Pivots and other parts for which non-ferrous material is unsuitable are to be of approved rustless steel where possible.

c. Fabrics, Cork, paper, etc. Fabrics, cork, paper and similar materials, which are not subsequently to be protected by impregnation, shall be adequately treated with an approved fungicide. Sleeving and fabrics treated with linseed oil or linseed oil varnishes shall not be used.

d. Wood. The use of wood in equipment shall be avoided as far as possible. When used, woodwork shall be of thoroughly seasoned teak or other approved wood that is resistant to fungal decay and shall be free from shakes and warp, sap and wane, knots, faults and other

blemishes. All woodwork shall be suitably treated to protect it against the ingress of moisture and from the growth of fungus and termite attack, unless it is naturally resistant to those causes of deterioration. All joints in woodwork shall be dovetailed or tongued and pinned as far as possible. Metal fittings where used shall be of non-ferrous material.

e. Adhesives. Adhesives shall be specially selected to ensure the use of types which are impervious to moisture, resistant to mould growth, and not subject to the ravages of insects. Synthetic resin cement only shall be used for joining wood. Casein cement shall be used.

f. Rubber. Neoprene and similar synthetic compounds, not subject to deterioration due to the climatic conditions, shall be used for gaskets, sealing rings, diaphragms, etc., instead of the standard rubber-based materials.

7.22 - Rating plates, nameplates and labels

Each main and auxiliary item of plant shall have permanently attached to it in a conspicuous position, a rating plate of indelible material upon which shall be engraved any identifying name, type or serial number, together with details of the loading conditions under which the item of plant has been designed to operate, and such diagram plates as may be required by the Engineer or Employer.

All items of plant shall be provided with a nameplate or label indicating, where necessary, its purpose and service position. The inscriptions shall be approved by the Engineer or be as detailed in the appropriate sections of this Specification. Each phase of alternating current and each pole of direct current equipment and connections shall be coloured in an approved manner to distinguish phase or polarity.

Phases of three phase alternating current systems shall be identified as follows: -

Phase	Colour
A R	Red
B S	Yellow
C T	Blue

Such nameplates or labels shall be of non-hygroscopic, non-transparent or translucent heat resisting material with engraved lettering of a contrasting colour or, alternatively, in the case of indoor circuit breaker, starters, etc, of transparent plastic material with suitably coloured lettering engraved on the back. Size, colour and engravings shall be subject to acceptance by the Engineer.

All inscriptions shall be in English except for Danger and Warning signs which shall be in both English and Arabic. Colour for Danger and Warning signs shall be approved by the Engineer.

Items of plant, such as valves, which are subject to handling, shall be provided with an engraved chromium plated brass nameplate or label not less than 3 mm thick with engraving filled with enamel.

The interior of each piece of equipment shall be clearly marked to show the phases and for this purpose either coloured plastic discs screwed to fixed components or identification by means of plastic sleeve or tape shall be used.

7.23 Cleaning and painting

All paints shall be applied in strict accordance with the paint manufacturer's instructions.

All painting shall be carried out on dry and clean surfaces and under suitable atmospheric and other conditions in accordance with the paint manufacturer's recommendations.

Meter panel carcass shall be constructed from 1.5mm sheet steel and painted with primer then undercoat, and finished in **paint code RAL 6019** .

7.24 - Earthing

All metal parts, other than those forming part of any electrical circuit, shall be connected to the main earth system by means of a hard drawn high conductivity copper earth tape with a cross sectional area such that the current density is not greater than 200 A/mm^2 for 1 second fault durations and 115 A/mm^2 for 3 second fault durations with a minimum of 30 mm^2.

7.25 - Cubicle wiring

Cubicle connections shall be insulated with PVC to IEC 60227. Wires shall not be jointed or teed between terminal points. Bus wires shall be fully insulated and run separately from one another along the top or bottom of the cubicle. Fuses and links or miniature circuit breakers shall be provided to enable all circuits in a cubicle, except a lighting circuit, to be isolated from the bus wires.

The dc trip and ac voltage supplies and wiring to main protective gear shall be segregated from those for back-up protection and also from protective apparatus for special purposes. Each such group shall be fed through separate fuses or miniature circuit breakers from the bus wires. There shall not be more than one set of supplies to the apparatus comprising each group. All wires associated with the tripping circuits shall be provided with red ferrules marked "Trip".

It shall be possible to work on small wiring for maintenance or test purposes without making a switchboard dead.

Insulated stranded wire shall have not less than seven strands and each strand shall be not less than 0.67 mm diameter. If single conductor is used it shall be annealed copper of circular cross-sectional area of not less than 2.5 mm2.

Claw washers or crimped connectors of approved type shall be used to terminate all small wiring.

When connections rated at 380 volt and above are taken through junction boxes they shall be adequately screened and "DANGER" notices shall be affixed to the outsides of junction boxes or marshalling kiosk.

Where connections to other equipment and supervisory equipment are required, the connections shall be grouped together.

7.26 - Supply voltage

All incoming supplies of greater than 125 V DC to earth and 400 V AC shall have their terminations shrouded by a suitable insulating material.

7.27 – Standards

The contractor shall provide one copy of the latest standards (IEC, BS, ANSI, DIN or other applicable standards) which are applicable to this contract to the Employer.

Section 6

Technical Schedules

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

Schedule A

MANUFACTURER TECHNICAL PARTICULARS AND GURANTEES

(Information to be submitted with tender)

Bidder shall complete the tables in this section and return with the proposal

Section/ Clause No.	Item	Confirmation of Compliance (Yes/No)	Bidder Comments
2.0	**Meters and Associated Metering Equipment**		
2.1	**Energy Meters**		
2.2	**Applicable Standards:** • **IEC 62053-22** – Alternating current static meters for active energy (Class 0.2S and 0.5S) • **IEC 62053-23** – Alternating current static meters for reactive energy (Class 2 and 3) • **IEC 62056-21** – Data exchange for meter reading – Direct local data exchange • **IEC 62052-11** – General requirements, tests and test conditions • **ISO 17025** – General requirements for the competence of		

	testing and calibration laboratories • **IEC 62053-31** – Pulse output devices for electromechanical and electronic meters (two wires only) • **ISO 9001** – Quality management systems • **ISO 14001** – Environmental management systems • **IEC 60068-2-1** – Environmental testing • **IEC 60068-2-2** – Basic environmental testing procedures • **IEC 60068-2-5** – Basic environmental testing procedures • **IEC 60068-2-6** – Environmental testing • **IEC 60068-2-11** – Basic environmental testing procedures • **IEC 60068-2-27** – Basic environmental testing procedures • **IEC 60068-2-30** – Basic environmental testing procedures • **IEC 60068-2-75** – Environmental testing • **IEC 60085** – Thermal evaluation and classification of electrical insulation • **IEC 60359** – Electrical and electronic measurement equipment – Expression of performance • **IEC 60387** – Symbols for alternating-current electricity meters • **IEC 60417-2** – Graphical symbols for use on equipment • **IEC 60529** – Degrees of protection provided by enclosures (IP Code) • **IEC 60695-2-11** – Fire hazard testing • **IEC 60721-3-3** – Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 3: Stationary use at weather		

	protected locations • **IEC 61000-4-2** – Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test. Basic EMC publication • **IEC 61000-4-3** – Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test • **IEC 60038** – IEC standard voltages • **IEC 60044-1** – Instrument transformers – Part 1: Current transformers • **IEC 60044-2** – Instrument transformers – Part 2: Inductive voltage transformers • **IEC 60050-300** – International Electro technical Vocabulary – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements – Part 312: General terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument • **IEC 60060-1** – High-voltage test techniques – Part 1: General definitions and test requirements		
2.3	**Energy Meter Accuracy:** For all active energy measurement Class 0.2S is required, and, for all reactive energy measurement Class 2.0 is required.		

2.4	**Environmental:** Energy meters shall function normally in the following conditions: • Ambient temperature of -5°C to 50°C • Storage conditions of between 0 and 30°C • Humidity of 75%		
2.5	**Electrical:** <u>Voltage</u> Nominal Voltage U_n: • Measuring circuitry (from voltage transformer): 3 x 100/120 Volts AC • Auxiliary circuitry: 1x 85-240 Volts AC and DC (universal power supply) Maximum voltage Umax: 130% Un <u>Current</u> Nominal current In: 1 Amp Maximum current Imax: 120% In Starting current: 0.1% In **Frequency** Nominal frequency: 50Hz ±2%		

2.6	**Others** If the meter auxiliary supply fails, the meter shall automatically switch to the VT input supply voltage and the recording of data shall not be interrupted, (DC) changing automatically to backup supply (AC) is required if the meters does not have internal voltage change over relays.in case that the meter does not have the internal voltage change over relays. Changing automatically to backup supply (AC) is required using external scheme. Primary values for voltage and current shall be programmable using the configuration software. Immunity from electrical interference shall be as prescribed in the IEC standards above. Meters required shall be three-phase, four-wire (3ph 4w), and can be connected in delta. A SuperCap or lithium battery shall provide backup power for RTC and the storage of register values and configuration data for up to one year without mains power applied.		
2.7	**Meters Mounting :** Energy meters shall be mounted in wall mount or standard Drawings stating the dimensions of meter shall be provided with the tender submission either separately or included in brochures or data sheets (also to be provided with the tender submission).		
2.8.1	**Alarms & Events:** The following energy meter generated alarms and events are required: • Internal battery low • One or more phase failure (programmable threshold level –		

	sampling frequency period to be stated) • Overvoltage (programmable threshold level – sampling frequency to be stated) • Meter re-programmed (incl. CT or VT ratio changed and RTC reset) • Meter last accessed time and date (local and remote) • Meter error (self test) • Voltage imbalance (programmable threshold and time delay)		
2.8.2	**Meter inputs:** Energy meters shall have a minimum of two programmable relay inputs in order that externally generated alarms can be reported back to the NCC or to the Head-end, data collection system.		
2.8.3	**Meter outputs:** Energy meters shall have a minimum of three configurable/programmable relay outputs available.		
2.8.4	**Registers:** The following meter registers are required: • Cumulative energy registers for: o Active energy – Import o Active energy – Export o Reactive energy – Import o Reactive energy – Export		

	• Programmable period (5, 10, 15 and 30 minute) Demand registers for:
	  ○ Active power – Import
	  ○ Active power – Export
	  ○ Reactive power – Import
	  ○ Reactive power – Export
	• Five Time of Use registers (Programmable by hour, day, month and season)
	• Five Programmable Billing cycle registers (Wh and VArh)
	All registers should be programmable to display W, kW, MW, etc. No multiplication factors shall be allowed.		

2.8.5	**Storage:** Data registers shall have adequate capacity to store three months on site data to allow for any interruptions to the automatic data Collection System, including: • Demand log (as per above) • Time of Use registers (Programmable by hour, day, month and season) • Programmable Billing cycle registers (Wh and VArh) • Voltage and current for each phase • Total power factor Also, to facilitate the storage of data, meters shall be fitted with an internal power supply e.g. battery, which should have a typical life under normal operating conditions of ten years.		

2.8.6	**Real Time Clock (RTC):** Start and end periods for Daylight Saving Time shall be programmable in the meter once only i.e. should not require re-programming each year. Adjustment for Daylight Saving shall occur in the meter automatically or as programmed i.e. ability to change automatically every year according to the setting of summer and winter time in the meter. Current Jordanian summer time starts on last Thursday in March at midnight, ending on last Friday in October at 01:00am. RTC shall not drift beyond 5 seconds per month. Energy meters should have local and remote time synchronization capability if the time drift outside acceptable limits the synchronization will be done through the AMR server(s).		
2.9	Meter Auxiliary Supplies: In case of meter Auxiliary Supplies failure, and to ensure continuity of remote data collection, and meter operation (and the transmission of alarms and events), the new energy meters are specified to include the facility for feed the meter from voltage transformer secondary supply using electronics within the meter. These auxiliary supplies shall normally be taken from the 110V DC battery within each Substation, but when fail, change-over to the VT input supply voltage.		
2.10.1	**Protocols:** Energy meters should preferably use a communications protocol that is based on an open, industry recognized standard e.g. DLMS. Meters purchased will be required to integrate to the Head-end, data collection system, and it is a condition of this tender that the bidder		

	ensures that this is possible. • **<u>Optional features</u>**: The cost of optional features shall be mentioned separately in the BoQ: 1- Meters may also be specified as IEC 61850 compatible for future Smart Grid integration. 2- Also another option is required to allow meters connection to SCADA 101& 104 as an optional feature.		
2.10.2	**Remote:** The TCP/IP over Ethernet communications can be either built-in type or as an internal module, and the physical connectivity shall be via RJ45 socket. Energy meters shall have an RS-485 output as well as an RJ45 output from the Ethernet communications module.		
2.10.3	**Local:** Local communications for meter reading and configuration purposes shall be possible via an optical port located on the front of the meter or by direct connection port. For calibration purposes, the optical port shall also be capable of providing a suitable output pulse to calibration equipment for both		

	active (W) and reactive (VAr) power. All accessories to communicate with the meter shall also be supplied.		
2.11	**Configuration Software** Meter configuration software shall be provided to enable local and remote (via the data network) programming of, but not limited to, the following: • Measurement transformer ratios • Measurement transformer compensation • Time and date • Demand period duration • Display sequence • Time of Use registers • Billing period A minimum of four test points from the combined error of the current transformer and voltage transformer should be capable of being programmed in the meter. The configuration software shall run on a Microsoft Windows environment and be compatible with a laptop computer (to be specified by the bidder – max. 15-inch screen). The laptop quoted shall be capable of supporting multiple configuration software packages for meters of different models and manufacturers. NECPO will carry out all energy meter programming related to CT and VT information.		
2.12	**Labelling:** Meters shall be marked "The Property of National Electric Power		

	Company" and shall be individually serial numbered according to NEPCO approved format. Circuit names (and Main/Check designation) shall also be labelled on the front of the meters (NEPCO to provided these following contract award). Primary and secondary values for voltage and current shall also be displayed on the meter nameplate as well as the circuit name (these will be supplied by NEPCO).		
2.13	**Security:** Configuration of the meter shall be controlled through appropriate multiple level password protected access – to be defined by the bidder. Meter cover and terminal cover shall have appropriate facilities for the application of a wire (or similar) security seal.		
2.14	**Warranty:** Energy meters supplied shall have a minimum warranty for 24 from the date of receipt of last consignment at site or NEPCO warehouses.		
2.15	**Literature:** Brochures and data sheets shall be supplied with the tender submission (in hard copy and soft copy version provided on CD/DVD or similar). One bound copy hard copy version and one of soft copy version (provided on CD/DVD or similar) of the Operation and Maintenance manuals shall also be quoted as part of the training package offered. Spare parts or other accessories shall also be stated in the literature provided by the bidder. All documents should be presented in English.		

3	**Metering Panels**		
3.1	**Schematic Arrangement:** Meter panels shall meet the requirements as shown in Figure 1 above. A maximum of four circuits can be arranged per panel.		
3.2	**Construction:** Meter panel carcass shall be constructed from 1.5mm sheet steel and painted with primer then undercoat, and finished in paint code RAL 6019. Completed panels shall be package to a suitable level of protection for sea freight shipping to ensure no damage occurs in transit. A minimum of four floor-fixing points shall be pre-drilled and available in the base of the cabinet. Gland plates suitable for a range of cable sizes shall be included at the base of the cabinet. Cabinets shall be (80-85 W x 60 D x 200-225 H) cm, and rack type with transparent (shatter proof plastic) single front door hinged on the right hand side. Rear opening shall be by two equally sized sheet steel doors with locking facility incorporated into the handles. The meters shall be mounting on swing frame hinged on the left side to allow easy access for replacing Energy meters and VSR, as shown in Appendix C and the final arrangement shall be Approved by NEPCO during the design stage. Energy Meter mounting surface shall be on swing frame assembly that open frontwards accessed by opening the transparent front door. Appropriate lifting eyes shall be fitted on the top of the panel and should withstand the additional weight of eight energy meters.		

	Cabinets shall be fitted with a thermostatically controlled fan for cooling purposes. Cabinets shall be fitted with an internal light source that is switched on/off when opening and closing the rear doors. Cabinets shall be fitted with a standard 13 Amp power socket. Bidders to submit General Arrangements and Wiring Diagrams of cabinet design proposed to be approved by NEPCO. Meter panels shall be tested to a protection level of IP52. An earthing bar shall also be included.		
3.3	**Wiring:** Panels shall be wired for the number of circuits/meters as described in the bill of quantities section (this includes for one spare circuit that can be added in the future). All panel wiring to be suitable for power and data signals as appropriate. All panel wiring shall be: • Multi-stranded • Color coded according to phase color (R, Y, B) • Minimum cross-sectional area of 2.5mm^2 for CT, VT and aux supplies circuits • The Auxiliary supply for the meters shall be chosen from 2 different sources, the main meters shall be fed from station 110 DC, while the check meters supplied from essential supply 230 AC. Wires shall not be terminated without crimps. Factory test certificates for all wiring checks e.g. point-to-point and continuity tests, shall be included.		

	Power and data cables shall be suitably separated inside the cabinet.		
3.4	**Accessories:** All Meter Panels shall come fully equipped with the following: • One 13Amp power socket (UK type 3 square pins) • One cooling fan with variable setting temperature-controlled switch • Internal lamp suitable for providing adequate light for working conditions, with door activated switch • DIN Rail and terminal blocks with appropriate isolation features and test point and earthing facilities • 10% spare terminals to be included • MCBs for incoming VT and power isolation with alarm contacts • Document/drawing storage pockets on the inside of the rear doors • All wiring to be enclosed in trunking with power and data cables separated • Engraved circuit labelling above each pair of meters (details to be provided by NEPCO) • Open/close links for VT circuits and open/close shorting links for CT circuits (as Appendix E – Open/close link type for use on VT and CT circuits)		

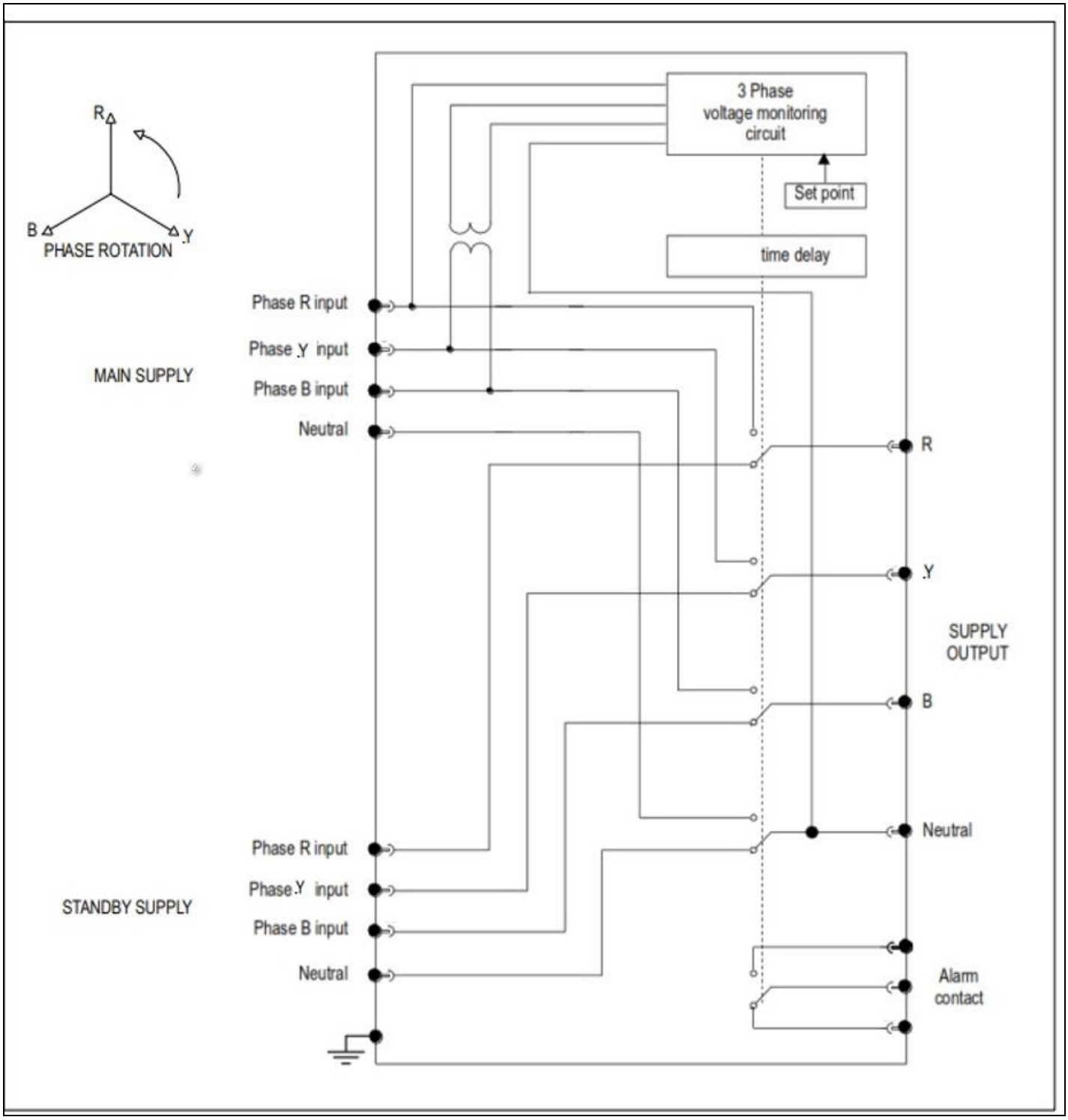
4.1	**<u>Voltage Selection Scheme:</u>** Voltage selection schemes shall be configured to switch from the designated voltage transformer secondary circuit to an alternative voltage transformer secondary (typically of a similar, adjacent circuit) should a single, or multiple phase failure occur. Upon operation of the voltage selection scheme, an auxiliary contact shall be available which can be used as an alarm output and may be used to indicate that a failure has occurred. Voltage Selection Schemes shall be included within the meter panel and follow the schematic diagram in Appendix B – Voltage Selection Relay. The Voltage Selection Schemes proposed, in addition to the above, shall suit the specific requirements of each substation and be subject to NEPCO approval. Discreet auxiliary relays are not deemed an acceptable solution for providing voltage selection, and as such shall not be proposed by the bidder, the required is a phase failure and voltage selection inside one reliable main relay. The VSR relay shall be equipped with a facility to choose the percentage to switch the operation from preferred to alternative supply with a suitable time delay. To facilitate maintenance to the voltage selection Scheme and avoid any disconnection during normal operation, it's required to add facility using two Sets of terminal to bypass all the selection relays easily by open and close few links to keep each circuit only supplied by its own voltage during maintenance of voltage selection scheme.		

4.2	**Technical Specification:** **Applicable Standards** The specific requirements for compliance with international standards shall include: • **Insulation class:** o IEC 601010-1: 1990/A2: 2001 Class I o EN 61010-1: 2001 Class I • **Insulation Category (Overvoltage):** o IEC 601010-1: 1990/A2: 1995 Category III o EN 61010-1: 2001 Category III • **Environment:** o IEC 601010-1: 1990/A2: 1995 Pollution degree 2 o EN 61010-1: 2001 Pollution degree 2 • **Product Safety:** -72/23/EEC -EN 61010-1: 2001 -EN 60950-1: 2002 **Environmental** The Voltage Selection Relay shall function normally in the following conditions: - Ambient temperature of -5°C to 50°C - Storage conditions of between 0 and 30°C - Humidity of 75%		

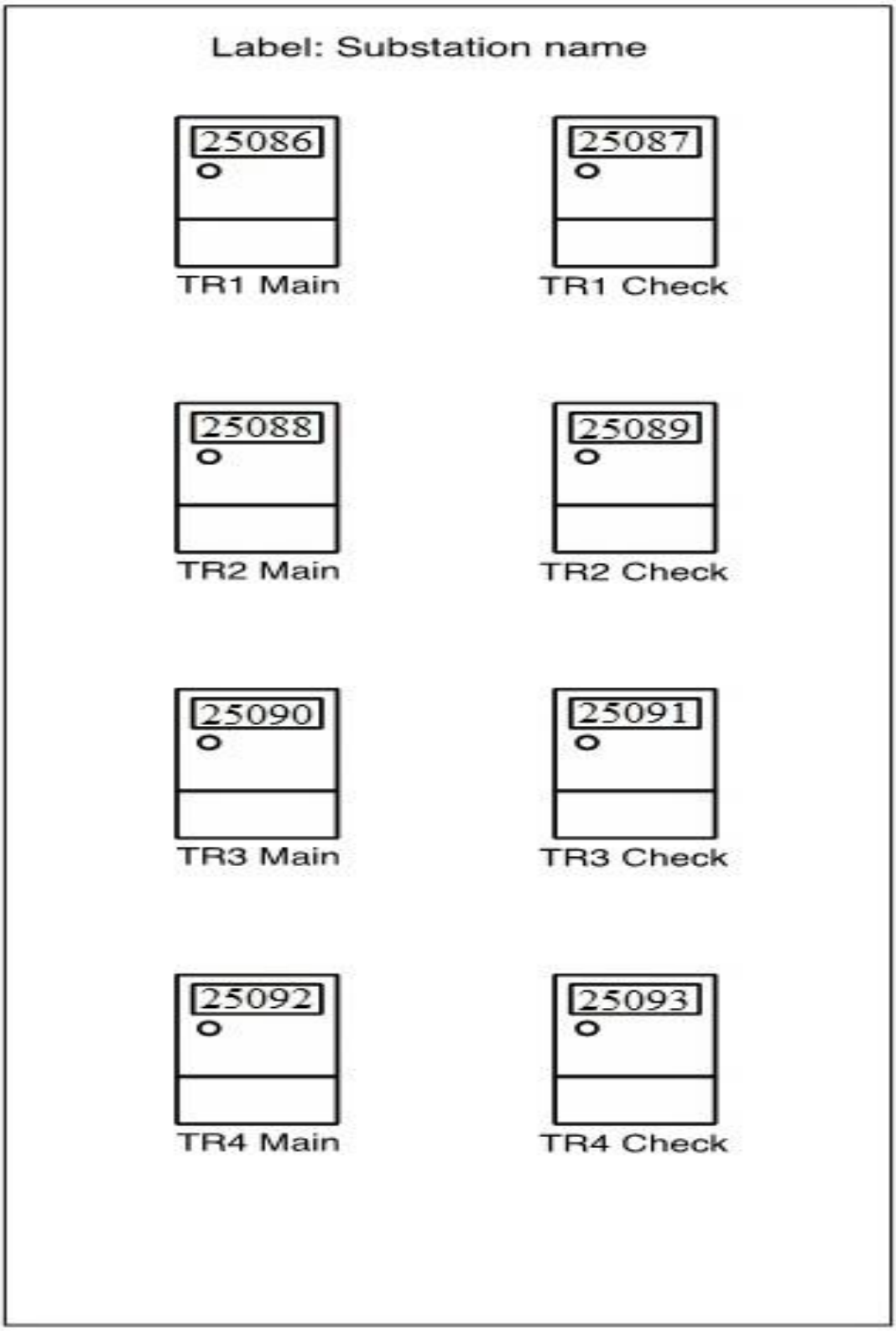
	Electrical From voltage transformer secondary: 110Volts ac System frequency: 50Hz		
	Documentation: • System user manuals • System technical manuals • Equipment / system instruction manuals • Installation; commissioning and maintenance manuals • Digital versions of installation and level drawings All documents shall contain the following: • Description of all volumes of each document (to be included in all volumes of the relevant document) • Content of each volume and section • Safety information (wherever applicable) • Cautions regarding operation and/or replacement of the modules (wherever applicable) All documents should be presented in English.		

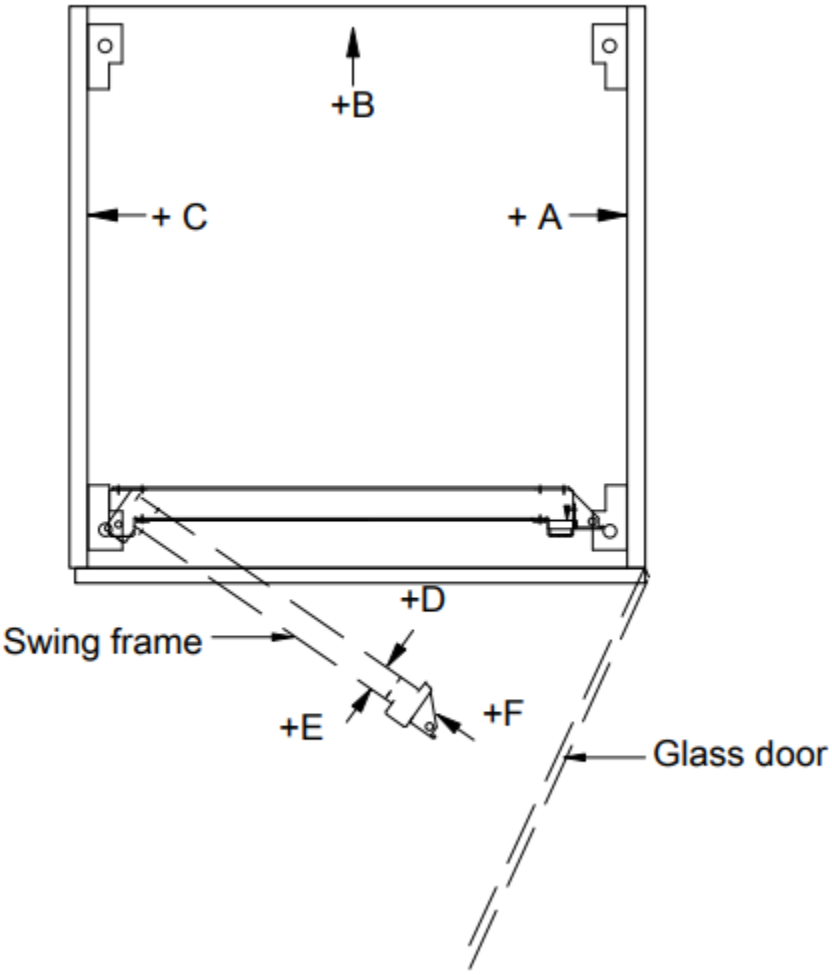
Appendix A – Open/close link type for use on VT and CT circuits

Appendix B – Voltage Selection Relay

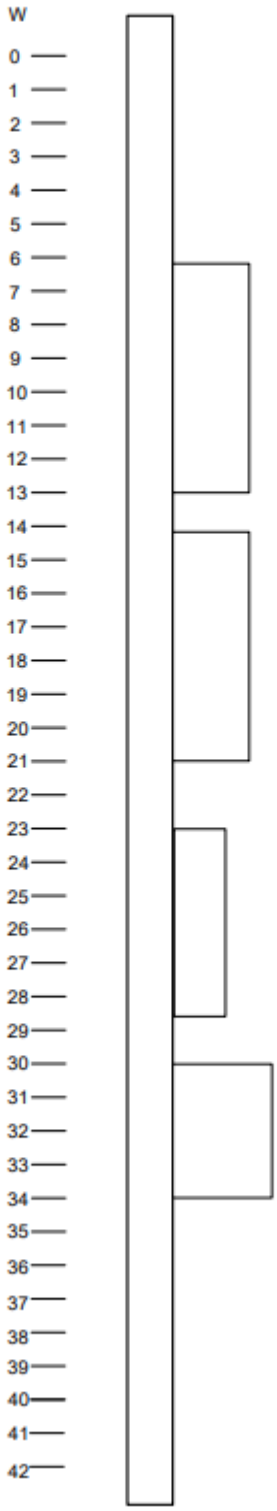


Appendix C – New Metering Panel Layout




+B
+ C
+ A
+D
Swing frame
+E
+F
Glass door

+F Side view hinged frame



NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

SCHEDULE B

PERIODS OF READINESS FOR INSPECTION AND DELIVERY
(Information to be supplied with Tender)

Item No.	Description	Completion Of Manufacturing
1	**Within which the materials will be ready for inspection and testing:**	
1.1	Energy Meters	
1.2	Voltage Selection Relays	
1.3	Metering Panels (full assembly)	

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

SCHEDULE C

MANUFACTURERS AND PLACE OF MANUFACTURE, TESTING AND INSPECTION
(Information to be supplied with Tender)

Item No.	Description	Manufacturer	Place of manufacture	Place of testing and inspection
MAIN EQUIPMENT				
1	Energy Meters			
2	Energy Meter compatibility with the AMR System			
3	Voltage Selection Relays			
4	Metering Panels (full assembly)			

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

SCHEDULE D
SUMMARY & MAIN SYSTEM PARAMETERS

Item No.	Item Description	Value (Particulars)
1	Site Altitude (m).	≤ 1000
2	Minimum ambient temperature (º C) .	-10
3	Design temperature (º C)	
	Outdoor	50
	Indoor	40
4	Highest average daily temperature (º C)	38
5	Relative humidity.	36 – 70 %
6	Design temperature (º C).	55
7	Seismic Conditions (Horizontal acceleration)	Zone 2B
8	Solar Radiation	1150W/Sq.m

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

SCHEDULE E

Departures from specification

To be filled by the tender, if any

SECTION 7

PRICE SCHEDULES

NATIONAL ELECTRIC POWER COMPANY
TENDER NO. 16/2026
SUPPLY OF ENERGY METERS & ANCILLARY EQUIPMENT

SCHEDULE G

PRICE OF EQUIPMENT

NOTE:
All equipment tabulated in the technical schedule (A) are to be supplied and considered in the scope of work although if they are not mentioned in these financial schedules, any discrepancy can be indicated during the Tendering stage.

ITEM	Description	Qty	Unit	Price	
				Foreign Currency: …….	
				Unit price CFR (Including Freight)	Total price CFR (Including Freight)
1	Energy Meters (3ph 4w) including associated Ethernet network module – surface mount (Including spare).	58	Piece		
2	Metering Panels (Including two spare panels as mentioned in technical specifications – GENERAL CLAUSES - Clause 1.5, Table No.1)	11	Piece		
3	Meter Configuration software License (IF NEPCO does not have the meter type).	1	Set		
4	Voltage Selection Relays (Including spare).	45	Piece		
6	AMR meter driver (if required)	As required	--		
7	FAT as per tender specifications.	2 Eng.	Person		
8	Meters configuration training course as per tender specifications.	2 Eng.	Person		
TOTAL TO OVER ALL SUMMARY SCHEDULE G					

TOTAL TENDER PRICE **Plus**

Foreign Currency	**Total Jordanian Dinars**

Say (in words):

……

……

……

- **The total Tender price should be filled the Form of Tender.**
- **Prices shall be excluding all custom duties and sales tax.**
- **The supplied Energy meters shall have local agent / Local representative in Jordan to provide efficient warranty support.**