



REPUBLIC OF THE PHILIPPINES  
**NATIONAL POWER CORPORATION**  
(Pambansang Korporasyon sa Elektrisidad)

## **BID DOCUMENTS**

Name of Project : **UPGRADING OF ANNUNCIATOR,  
CONTROL AND PROTECTION SYSTEM  
OF UNIT 3 AT AGUS 2 HEP PLANT**

Project Location : **AGUS 2 HEP PLANT, SAGUIARAN,  
LANAO DEL NORTE**

PR No. : **MA-A2M23-055**

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Design and Development Department





# National Power Corporation

## INVITATION TO BID

### PUBLIC BIDDING – BCS 2023-0572

- The NATIONAL POWER CORPORATION (NPC), through its approved Corporate Budget of CY 2023 intends to apply the sum of **(Please see schedule below)** being the Approved Budget for the Contract (ABC) to payments under the contract. Bids received in excess of the ABC shall be automatically rejected at Bid opening.

PR Nos./PB Ref No. & Description	Similar Contracts	Pre-bid Conference	Bid Submission / Opening	ABC/ Amt. of Bid Docs
MA-A2M23-055 / PB231121-JD00358  Upgrading of Annunciator, Control and Protection System of Unit 3 at Agus 2 HEP Plant	Upgrading or Supply, Delivery, Installation, Testing and Commissioning of Annunciator, Control and Protection System for Power Plant	07 November 2023 9:30 A.M.	21 November 2023 9:30 A.M.	₱ 37,767,000.00 / ₱ 25,000.00
<b>Venue: Kañiao Function Room, NPC Bldg. Diliman, Quezon City</b>				

- The NPC now invites bids for Items listed above. Delivery of the Goods is required (**see table below**) specified in the Technical Specifications. Bidders should have completed, within (**see table below**) from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. (Instruction to Bidders).

PR No/s. / PB Ref No/s.	Delivery Period / Contract Duration	Relevant Period of SLCC reckoned from the date of submission & receipt of bids
MA-A2M23-055	One Hundred Eighty (180) Calendar Days	Fifteen (15) Years


- Bidding will be conducted through open competitive bidding procedures using a non-discretionary "pass/fail" criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines, and to citizens or organizations of a country the laws or regulations of which grant similar rights or privileges to Filipino citizens, pursuant to RA 5183.

- Prospective Bidders may obtain further information from National Power Corporation, Bids and Contracts Services Division and inspect the Bidding Documents at the address given below during office hours (8:00AM to 5:00PM), Monday to Friday.
- A complete set of Bidding Documents may be acquired by interested Bidders from the given address and website(s) and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB. Bidding fee may be refunded in accordance with the guidelines based on the grounds provided under Section 41 of R.A. 9184 and its Revised IRR.
- The National Power Corporation will hold Pre-Bid Conference (**see table above**) and/or through video conferencing or webcasting which shall be open to prospective bidders. Only registered bidder/s shall be allowed to participate in the conduct of virtual pre-bid conference. **Unregistered bidders** may attend the Pre-Bid Conference at the Kañiao Room, NPC subject to the following:
  - Only a maximum of two (2) representatives from each bidder / company shall be allowed to participate during the virtual pre-bid conference.

- b. Wearing of Face Masks is recommended but not required in view of Proclamation No. 297 S.2023 lifting the State of Public Health Emergency Throughout the Philippines
  - c. The requirements herein stated including the medium of submission shall be subject to GPPB Resolution No. 09-2020 dated 07 May 2020
  - d. The Guidelines on the Implementation of Early Procurement Activities (EPA) shall be subject to GPPB Circular No. 06-2019 dated 17 July 2019
7. Bids must be duly received by the BAC Secretariat through (i) manual submission at the office address indicated below; (ii) online or electronic submission before the specified time stated in the table above for opening of bids. Late bids shall not be accepted.
  8. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in ITB Clause 14.
  9. Bid opening shall be in the Kañao Function Room, NPC Head Office, Diliman, Quezon City and/or via online platform to be announced by NPC. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.
  10. The National Power Corporation reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised IRR of R.A. No. 9184, without thereby incurring any liability to the affected bidder or bidders.
  11. For further information, please refer to:  
**Bids and Contracts Services Division,  
Logistics Department**  
BIR Road cor. Quezon Avenue  
Diliman, Quezon City  
Tel Nos.: 8924-5211 and 8921-3541 local 5564/5211  
Email: [bcسد@napocor.gov.ph](mailto:bcسد@napocor.gov.ph) /
  12. You may visit the following websites:

For downloading of Bidding Documents: <https://www.napocor.gov.ph/bcsd/bids.php>

  
**ATTY. MELCHOR P. RIDULME**  
Vice President, Office of the Legal Counsel and  
Chairman, Bids and Awards Committee

SECTION II

**INSTRUCTIONS TO  
BIDDERS**

## SECTION II – INSTRUCTIONS TO BIDDERS

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## SECTION II – INSTRUCTIONS TO BIDDERS

### 1. Scope of Bid

The **National Power Corporation (NPC or NAPOCOR)** wishes to receive Bids for the **UPGRADING OF ANNUNCIATOR, CONTROL AND PROTECTION SYSTEM OF UNIT NO. 3 AT AGUS 2 HEP PLANT**, with identification number **PR NO. MA-A2M23-055**.

The Procurement Project (referred to herein as “Project”) is composed of one (1) lot and will be awarded to one (1) Bidder in one complete contract, the details of which are described in Section VII (Technical Specifications).

### 2. Funding Information

2.1. The GOP through the source of funding as indicated below for CY 2023 in the amount of **₱ 37,767,000.00**.

2.2. The source of funding is the Corporate Operating Budget of the National Power Corporation.

### 3. Bidding Requirements

The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manuals and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or IB by the BAC through the issuance of a supplemental or bid bulletin.

The Bidder, by the act of submitting its Bid, shall be deemed to have verified and accepted the general requirements of this Project, including other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

### 4. Corrupt, Fraudulent, Collusive, and Coercive Practices

The Procuring Entity, as well as the Bidders and Suppliers, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex “I” of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

### 5. Eligible Bidders

5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.

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**SECTION II – INSTRUCTIONS TO BIDDERS**

- 5.2. Foreign ownership exceeding those allowed under the rules may participate when citizens, corporations, or associations of a country, included in the list issued by the GPPB, the laws or regulations of which grant reciprocal rights or privileges to citizens, corporations, or associations of the Philippines.

The foreign bidder claiming eligibility by reason of their country's extension of reciprocal rights to Filipinos shall submit a certification from the relevant government office of their country stating that Filipinos are allowed to participate in their government procurement activities for the same item/product. The said certification shall be validated during the post-qualification of bidders.

- 5.3. Pursuant to Section 23.4.1.3 of the 2016 revised IRR of RA No.9184, the Bidder shall have an SLCC that is at least one (1) contract similar to the Project the value of which, adjusted to current prices using the PSA's CPI, must be at least equivalent to at least fifty percent (50%) of the ABC.
- 5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.1 of the 2016 IRR of RA No. 9184.

## **6. Origin of Goods**

There is no restriction on the origin of goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN, subject to Domestic Preference requirements under **ITB** Clause 18.

## **7. Subcontracts**

- 7.1. The Bidder may subcontract portions of the Project to the extent allowed by the Procuring Entity as stated herein, but in no case more than twenty percent (20%) of the Project.

The portions of Project and the maximum percentage allowed to be subcontracted are indicated in the **BDS**, which shall not exceed twenty percent (20%) of the contracted Goods.

- 7.2. The Supplier may identify its subcontractor during the contract implementation stage. Subcontractors identified during the bidding may be changed during the implementation of this Contract. Subcontractors must submit the documentary requirements under Section 23.1 of the 2016 revised IRR of RA No. 9184 and comply with the eligibility criteria specified in **ITB** Clause 5 to the implementing or end-user unit.
- 7.3. Subcontracting of any portion of the Project does not relieve the Supplier of any liability or obligation under the Contract. The Supplier will be responsible for the acts, defaults, and negligence of any subcontractor, its agents, servants, or workmen as fully as if these were the Supplier's own acts, defaults, or negligence, or those of its agents, servants, or workmen.

## **8. Pre-Bid Conference**

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address and/or through videoconferencing/webcasting as indicated in paragraph 6 of the **IB**.

## 9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

## 10. Documents comprising the Bid: Eligibility and Technical Components

- 10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in Section VIII (NPCSF-GOODS-01 - Checklist of Technical and Financial Documents).
- 10.2. The Bidder's SLCC as indicated in **ITB** Clause 5.3 should have been completed within Fifteen (15) Years prior to the deadline for the submission and receipt of bids.
- 10.3. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. Similar to the required authentication above, for Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.
- 10.4. The Statement of the bidder's Single Largest Completed Contract (SLCC) (NPCSF-GOODS-03) and List of all Ongoing Government & Private Contracts Including Contracts Awarded but not yet Started (NPCSF-GOODS-02) shall comply with the documentary requirements specified in the **BDS**.

## 11. Documents comprising the Bid: Financial Component

- 11.1. The second bid envelope shall contain the financial documents for the Bid as specified in Section VIII (NPCSF-GOODS-01 - Checklist of Technical and Financial Documents).
- 11.2. If the Bidder claims preference as a Domestic Bidder or Domestic Entity, a certification issued by DTI shall be provided by the Bidder in accordance with Section 43.1.3 of the 2016 revised IRR of RA No. 9184.
- 11.3. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.
- 11.4. For Foreign-funded Procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

## 12. Bid Prices

- 12.1. Prices indicated on the Price Schedule shall be entered separately in the following manner:
  - a. For Goods offered from within the Procuring Entity's country:



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SECTION II – INSTRUCTIONS TO BIDDERS

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- i. The price of the Goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable);
  - ii. The cost of all customs duties and sales and other taxes already paid or payable;
  - iii. The cost of transportation, insurance, and other costs incidental to delivery of the Goods to their final destination; and
  - iv. The price of other (incidental) services, if any, listed in the **BDS**.
- b. For Goods offered from abroad:
- i. Unless otherwise stated in the **BDS**, the price of the Goods shall be quoted delivered duty paid (DDP) with the place of destination in the Philippines as specified in the **BDS**. In quoting the price, the Bidder shall be free to use transportation through carriers registered in any eligible country. Similarly, the Bidder may obtain insurance services from any eligible source country.
  - ii. The price of other (incidental) services, if any, as listed in the **BDS**.

### 13. Bid and Payment Currencies

13.1. For Goods that the Bidder will supply from outside the Philippines, the bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies, shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

13.2. Payment of the contract price shall be made in Philippine Pesos.

### 14. Bid Security

14.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

14.2. The Bid and bid security shall be valid for **One Hundred Twenty (120) calendar** days from the date of opening of bids. Any Bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

### 15. Sealing and Marking of Bids

Each Bidder shall submit Two (2) copies of the first and second components of its Bid, marked **Original** and photocopy. Only the original copy will be read and considered for the bid.

Any misplaced document outside of the **Original** copy will not be considered. The photocopy is ONLY FOR REFERENCE.

The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

If the Procuring Entity allows the submission of bids through online submission to the given website or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

Bidders must also comply with the Disclaimer and Data Privacy Notice specified in the **BDS**.

## 16. Deadline for Submission of Bids

16.1. The Bidders shall submit on the specified date and time and either at its physical address or through online submission as indicated in paragraph 7 of the **IB**.

## 17. Opening and Preliminary Examination of Bids

17.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

17.2. The preliminary examination of bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

## 18. Domestic Preference

18.1. The Procuring Entity will grant a margin of preference for the purpose of comparison of Bids in accordance with Section 43.1.2 of the 2016 revised IRR of RA No. 9184.

## 19. Detailed Evaluation and Comparison of Bids

19.1. The Procuring Entity's BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*," using non-discretionary pass/fail criteria. The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of the 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, bidders may submit a proposal on any of the lots or items, and evaluation will be undertaken on a per lot or item basis, as the case maybe. In this case, the Bid Security as required by **ITB** Clause 14 shall be submitted for each lot or item separately.

19.3. The descriptions of the lots or items shall be indicated in **Section VII (Technical Specifications)**, although the ABCs of these lots or items are indicated in the **BDS** for purposes of the NFCC computation pursuant to Section 23.4.2.6 of the

2016 revised IRR of RA No. 9184. The NFCC must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder.

- 19.4. The Project shall be awarded to one (1) Bidder in one complete contract.
- 19.5. Except for bidders submitting a committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation, all Bids must include the NFCC computation pursuant to Section 23.4.1.4 of the 2016 revised IRR of RA No. 9184, which must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder. For bidders submitting the committed Line of Credit, it must be at least equal to ten percent (10%) of the ABCs for all the lots or items participated in by the prospective Bidder.

## 20. Post-Qualification

- 20.1. Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit its latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS) and other appropriate licenses and permits required by law and stated in the **BDS**.

## 21. Signing of the Contract

- 21.1. The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

SECTION III

**BID DATA SHEET**



## SECTION III - BID DATA SHEET

ITB Clause	
5.3	<p>For this purpose, similar contracts shall refer to upgrading or supply, delivery, installation, testing and commissioning of Annunciator, Control and Protection System for Power Plant.</p> <p>The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.</p> <p>It shall be a ground for disqualification, if verification and validation cannot be conducted for reasons attributable to the Bidder.</p>
7.1	<p>Subcontracting may be allowed on transport, local/non-skilled labor under the supervision of the Bidder. The Bidder shall not be relieved from any liability or obligation that may arise from the performance of the Subcontractor.</p>
10.1	<p>The prospective bidder shall submit a valid and updated Certificate of PhilGEPs Registration under Platinum Membership (all pages including the Annex A of the said Certificate). <b>Non-compliance shall be a ground for disqualification.</b></p>
10.4	<p>The list of on-going contracts (Form No. NPCSF-GOODS-02) shall be supported by the following documents for each on-going contract to be submitted during <b>Post-Qualification</b>:</p> <ol style="list-style-type: none"> <li>1. Contract/Purchase Order and/or Notice of Award</li> <li>2. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date</li> </ol> <p>The bidder shall declare in this form all his on-going government and private contracts including contracts where the bidder (either as individual or as a Joint Venture) is a partner in a Joint Venture agreement other than his current joint venture where he is a partner. Non declaration will be a ground for disqualification of bid.</p> <p>The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid (Form No. NPCSF-GOODS-03) shall be supported by the following documents to be submitted during <b>Bid Opening</b>:</p> <ol style="list-style-type: none"> <li>1. Certificate of Acceptance; or Certificate of Completion; or Official Receipt (O.R); or Sales Invoice</li> </ol> <p>Any single bidder/s who already procured/secured the bidding documents but want to avail the Joint Venture Agreement (JVA) shall inform the BAC in writing prior to the bid opening for records and documentation purposes.</p>

10.5	<p>Bidders shall also submit the following requirements in their first envelope, Eligibility and Technical Component of their bid:</p> <ol style="list-style-type: none"> <li>1. Data and Information to be submitted with the Proposal as specified in Clause TS-9.0(a) of Section VI - Technical Specifications;</li> <li>2. Complete eligibility documents of the proposed sub-contractor, if any</li> </ol>
12	<p>The price of the Goods shall be quoted DDP Project Site or the applicable International Commercial Terms (INCOTERMS) for this Project.</p>
14.1	<p>The bid security shall be in the form of a Bid Securing Declaration, or any of the following forms and amounts:</p> <ol style="list-style-type: none"> <li>a) The amount of not less two percent (2%) of ABC, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; or</li> <li>b) The amount of not less than five percent (5%) of ABC, if bid security is in Surety Bond.</li> </ol>
15.0	<p>All bid submissions and related correspondences are confidential and for viewing only by the intended recipient/s. Any unauthorized access to review, reproduce, or disseminate the information contained therein is strictly prohibited. The National Power Corporation (NAPOCOR) does not guarantee the security of any information electronically transmitted.</p> <p>Bid submissions and related correspondences may contain personal and sensitive personal information, and are subject to the Data Privacy Act of 2012, its implementing rules, regulations and issuances of the National Privacy Commission of the Philippines ("Privacy Laws"). By viewing, using, storing, sharing and disposing (collectively "Processing"), such bids submissions and correspondences, you agree to comply with the Privacy Laws. By responding to correspondence, you consent to the Processing by NAPOCOR of the Personal Data contained in your submission/reply in accordance with NAPOCOR's Personal Data Privacy Policy which you can find at <a href="http://www.napocor.gov.ph">http://www.napocor.gov.ph</a>.</p> <p>To report any privacy issue, contact the Data Privacy Officer at <a href="mailto:dpo@napocor.gov.ph">dpo@napocor.gov.ph</a>.</p> <p>NAPOCOR is not liable for the proper and complete transmission of the information contained in bid submission/correspondences nor for any delay in its receipt.</p>
19.3	<p>The Goods are grouped together in one (1) lot and will be awarded to one (1) Bidder in one complete contract.</p> <p>Partial bid is not allowed. The Goods are grouped in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.</p> <p>The Bidders bid offer must be within the ABC of the lot.</p>

	Bid offers that exceed the ABC of the lot or with incomplete price, shall be rejected.
19.5	If the Bidder opted to submit a Committed Line of Credit (CLC), the bidder must submit a granted credit line valid/effective at the date of bidding.
20.1	<p>Additional documents to be submitted during Post-Qualification:</p> <ul style="list-style-type: none"> <li>a. Class A – Eligibility Documents listed on the Annex A of Certificate of PhilGEPs Registration under Platinum Membership pursuant to Section 34.3 of the Revised IRR of R.A. 9184</li> <li>b. Contract/Purchase Order and/or Notice of Award for the contracts stated in the List of all Ongoing Government &amp; Private Contracts Including Contracts Awarded but not yet Started (NPCSF-GOODS-02);</li> <li>c. Certification coming from the project owner/client that the performance is satisfactory as of the bidding date for all ongoing contracts stated in Form NPCSF-GOODS-02;</li> <li>d. Contract/Purchase Order for the contract stated in the Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid (Form No. NPCSF-GOODS-03)</li> <li>e. Documents to be submitted during post-qualification process as specified in TS-9.0(b) of Section VI-Technical Specifications</li> </ul> <p>Manufacturer's brochures, manuals and other supporting documents of equipment, materials, hardware and tools proposed by the bidders must comply with the technical specifications of such equipment, materials, hardware and tools. It shall be a ground for disqualification if the submitted brochures, manuals and other supporting documents are determined not complying with the specifications during technical evaluation and post-qualification process.</p> <p>Equipment, materials, hardware and tools proposed by the winning bidder to be supplied, which were evaluated to be complying with the technical specifications, shall not be replaced and must be the same items to be delivered/installed/used during the contract implementation. Any proposed changes/replacement of said items may be allowed on meritorious reasons subject to validation and prior approval by NPC.</p>
20.2	The licenses and permits relevant to the Project and the corresponding law requiring it as specified in the Technical Specifications, if any.
21.2	Notice to Proceed.

SECTION IV

**GENERAL CONDITIONS  
OF CONTRACT**



## SECTION IV – GENERAL CONDITIONS OF CONTRACT

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## SECTION IV – GENERAL CONDITIONS OF CONTRACT

### 1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

Additional requirements for the completion of this Contract shall be provided in the **Special Conditions of Contract (SCC)**.

### 2. Advance Payment and Terms of Payment

- 2.1. Advance payment of the contract amount is provided under Annex "D" of the revised 2016 IRR of RA No. 9184.
- 2.2. The Procuring Entity is allowed to determine the terms of payment on the partial or staggered delivery of the Goods procured, provided such partial payment shall correspond to the value of the goods delivered and accepted in accordance with prevailing accounting and auditing rules and regulations. The terms of payment are indicated in the **SCC**.

### 3. Performance Security

- 3.1. Within ten (10) calendar days from receipt of the Notice of Award by the Bidder from the Procuring Entity but in no case later than the signing of the Contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR of RA No. 9184.
- 3.2. The performance bond to be posted by the Contractor must also comply with additional requirements specified in the **SCC**.

### 4. Inspection and Tests

The Procuring Entity or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Project specifications at no extra cost to the Procuring Entity in accordance with the Generic Procurement Manual. In addition to tests in the **SCC, Section VII (Technical Specifications)** shall specify what inspections and/or tests the Procuring Entity requires, and where they are to be conducted. The Procuring Entity shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

All reasonable facilities and assistance for the inspection and testing of Goods, including access to drawings and production data, shall be provided by the Supplier to the authorized inspectors at no charge to the Procuring Entity.

## **5. Warranty**

- 5.1 In order to assure that manufacturing defects shall be corrected by the Supplier, a warranty shall be required from the Supplier as provided under Section 62.1 of the 2016 revised IRR of RA No. 9184.
- 5.2 The Procuring Entity shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall, repair or replace the defective Goods or parts thereof without cost to the Procuring Entity, pursuant to the Generic Procurement Manual.

## **6. Liability of the Supplier**

The Supplier's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

If the Supplier is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

SECTION V

**SPECIAL CONDITIONS  
OF CONTRACT**

**SECTION IV – SPECIAL CONDITIONS OF CONTRACT**

GCC Clause	
1	<p><b>Delivery and Documents –</b></p> <p>The delivery terms applicable to the Contract is DDP delivered to the project site specified in the technical specifications, in accordance with INCOTERMS. Risk and title will pass from the Supplier to the Procuring Entity upon receipt and final acceptance of the Goods at their final destination.</p> <p>Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in Section VI – Technical Specifications. The details of shipping and/or other documents to be furnished by the Supplier are as follows:</p> <p><i>For Goods supplied from within the Philippines</i></p> <p>Upon delivery of the Goods to the Project Site, the Supplier shall notify the Procuring Entity and present the following documents to the Procuring Entity:</p> <ul style="list-style-type: none"> <li>(i) Original and four copies of the Supplier's invoice showing Goods' description, quantity, unit price, and total amount;</li> <li>(ii) Original and four copies of Supplier's factory test/inspection report;</li> <li>(iii) Original and four copies of the certificate of origin (for imported Goods);</li> <li>(iv) Delivery receipt detailing number and description of items received signed by the Procuring Entity's representative at the Project Site;</li> <li>(v) Certificate of Completion/Inspection Report signed by the Procuring Entity's representative at the Project Site;</li> <li>(vi) Original and four copies of the Inspection Receiving Report signed by the Procuring Entity's representative at the Project Site;</li> <li>(vii) Original and four copies of the Manufacturer's and/or Supplier's warranty certificate; and</li> <li>(viii) Documents specified in the Technical Specifications, if any.</li> </ul> <p><i>For Goods supplied from abroad:</i></p> <p>Upon shipment, the Supplier shall notify the Procuring Entity and the insurance company by e-mail the full details of the shipment, including Contract Number, description of the Goods, quantity, vessel, bill of lading number and date, port of loading, date of shipment, port of discharge etc. Upon delivery to the Project Site, the Supplier shall notify the Procuring Entity and present the following documents as applicable with the documentary requirements of any letter of credit issued taking precedence:</p> <ul style="list-style-type: none"> <li>(i) Original and four copies of the Supplier's invoice showing Goods' description, quantity, unit price, and total amount;</li> </ul>



- (ii) Original and four copies of the negotiable, clean shipped on board bill of lading marked "freight pre-paid" and five copies of the non-negotiable bill of lading ;
- (iii) Original and four copies of Supplier's factory test/inspection report;
- (iv) Delivery receipt detailing number and description of items received signed by the Procuring Entity's representative at the Project Site;
- (v) Certificate of Completion/Inspection Report signed by the Procuring Entity's representative at the Project Site;
- (vi) Original and four copies of the Inspection Receiving Report signed by the Procuring Entity's representative at the Project Site;
- (vii) Original and four copies of the certificate of origin (for imported Goods); and
- (viii) Original and four copies of the Manufacturer's and/or Supplier's warranty certificate including all other documents specified in the Technical Specifications, if any.

For purposes of this Clause the Procuring Entity's Representative at the Project Site is VP - Mindanao Generations.

**Incidental Services –**

The Supplier is required to provide all of the following services, including additional services, if any, specified in Section VI. Schedule of Requirements:

- a. performance or supervision of on-site assembly and/or start-up of the supplied Goods;
- b. furnishing of tools required for assembly and/or maintenance of the supplied Goods;
- c. furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;
- d. performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and
- e. training of the Procuring Entity's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods.
- f. Additional requirements specified in Section VI – Technical Specifications, if any.

The Contract price for the Goods shall include the prices charged by the Supplier for incidental services and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

**Spare Parts –**

The Supplier is required to provide all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:

1. such spare parts as the Procuring Entity may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under this Contract; and
2. in the event of termination of production of the spare parts:
  - i. advance notification to the Procuring Entity of the pending termination, in sufficient time to permit the Procuring Entity to procure needed requirements; and
  - ii. following such termination, furnishing at no cost to the Procuring Entity, the blueprints, drawings, and specifications of the spare parts, if requested

The spare parts and other components required are listed in **Section VI (Technical Specifications)** and **Section VII (Schedule of Requirements/Bid Price Schedule)** and the costs thereof are included in the contract price.

The Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spare parts or components for the Goods for the period specified in the Technical Specifications.

Spare parts or components shall be supplied as promptly as possible, but in any case, within three (3) months of placing the order.

**Packaging –**

The Supplier shall provide such packaging of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in this Contract. The packaging shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packaging case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

The packaging, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified below, and in any subsequent instructions ordered by the Procuring Entity.

The outer packaging must be clearly marked on at least four (4) sides as follows:

- Name of the Procuring Entity
- Name of the Supplier
- Contract Description
- Final Destination
- Gross weight



	<p>Any special lifting instructions Any special handling instructions Any relevant HAZCHEM classifications</p> <p>A packaging list identifying the contents and quantities of the package is to be placed on an accessible point of the outer packaging if practical. If not practical the packaging list is to be placed inside the outer packaging but outside the secondary packaging.</p> <p><b>Transportation –</b></p> <p>Where the Supplier is required under Contract to deliver the Goods CIF, CIP, or DDP, transport of the Goods to the port of destination or such other named place of destination in the Philippines, as shall be specified in this Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price.</p> <p>Where the Supplier is required under this Contract to transport the Goods to a specified place of destination within the Philippines, defined as the Project Site, transport to such place of destination in the Philippines, including insurance and storage, as shall be specified in this Contract, shall be arranged by the Supplier, and related costs shall be included in the contract price.</p> <p>Where the Supplier is required under Contract to deliver the Goods CIF, CIP or DDP, Goods are to be transported on carriers of Philippine registry. In the event that no carrier of Philippine registry is available, Goods may be shipped by a carrier which is not of Philippine registry provided that the Supplier obtains and presents to the Procuring Entity certification to this effect from the nearest Philippine consulate to the port of dispatch. In the event that carriers of Philippine registry are available but their schedule delays the Supplier in its performance of this Contract the period from when the Goods were first ready for shipment and the actual date of shipment the period of delay will be considered force majeure.</p> <p>The Procuring Entity accepts no liability for the damage of Goods during transit other than those prescribed by INCOTERMS for DDP deliveries. In the case of Goods supplied from within the Philippines or supplied by domestic Suppliers risk and title will not be deemed to have passed to the Procuring Entity until their receipt and final acceptance at the final destination.</p> <p><b>Intellectual Property Rights –</b></p> <p>The Supplier shall indemnify the Procuring Entity against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof.</p>
<p>2.2</p>	<p>Advance payment not to exceed fifteen percent (15%) of the contract amount shall be allowed and paid within sixty (60) calendar days from effectivity of the contract and upon the submission to and acceptance by the Procuring Entity of an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank. The irrevocable letter of credit or bank guarantee must be for an equivalent amount, shall remain valid until the goods are delivered, and accompanied by a claim for advance payment.</p>





All progress payments shall first be charged against the advance payment until the latter has been fully exhausted.

The terms of payment shall be as follows:

**1) For Supply and Delivery Contracts:**

- (a) On Contract Effectivity: Advance payment of Fifteen percent (15%) of the total Contract Price shall be paid within sixty (60) days from effectivity of the Contract and upon submission of a claim and an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank for the equivalent amount valid until the Goods are delivered and in the form provided in Section VIII- Bidding Forms.
- (b) On Delivery: Eighty percent (80%) of the Contract Price of the **delivered Goods** shall be considered for payment, less the total amount of advance payment, if any and other deductions. If the amount is sufficient to fully recoup the advance payment, the remainder after deductions shall be paid to the Supplier within sixty (60) days after the date of receipt of the Goods and upon submission of the documents (i) through (vi) specified in the SCC provision on Delivery and Documents. Otherwise, the total delivery payment shall be charged against the advance payment and the remaining advance payment will be fully recouped from the succeeding claims.
- (c) On Acceptance: The remaining twenty percent (20%) of the Contract Price of the **delivered Goods** shall be paid to the Supplier within sixty (60) days after the date of submission of the acceptance and inspection certificate for the respective delivery issued by the Procuring Entity's authorized representative. In the event that no acceptance certificate is issued by the Procuring Entity's authorized representative within forty five (45) days after successful test and commissioning, if required, the Supplier shall have the right to claim payment of the remaining twenty percent (20%) subject to the Procuring Entity's own verification of the reason(s) for the failure to issue documents (vii) and (viii) as described in the SCC provision on Delivery and Documents.

**2) For Supply, Delivery, Installation, Test and Commissioning Contracts:**

- (a) On Contract Effectivity: Advance payment of Fifteen percent (15%) of the total Contract Price shall be paid within sixty (60) days from effectivity of the Contract and upon submission of a claim and an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank for the equivalent amount valid until the Goods are delivered and in the form provided in Section VIII- Bidding Forms.
- (b) On Delivery: Eighty percent (80%) of the price of the **delivered Goods**, excluding price for installation, test and commissioning shall be considered for payment, less the total amount of advance payment, if any and other deductions. If the amount is sufficient to fully recoup the advance payment, the remainder after deductions shall be paid to the Supplier within sixty (60) days after the date of receipt of the Goods and upon submission of the documents (i) through (vi) specified in the

SCC provision on Delivery and Documents. Otherwise, the total delivery payment shall be charged against the advance payment and the remaining advance payment will be fully recouped from the succeeding claims.

- (c) On Acceptance: The remaining twenty percent (20%) of the price of the **delivered Goods** plus price for installation, test and commissioning shall be paid to the Supplier within sixty (60) days after the date of submission of the acceptance and inspection certificate for the respective delivery issued by the Procuring Entity's authorized representative. In the event that no acceptance certificate is issued by the Procuring Entity's authorized representative within forty five (45) days after successful test and commissioning, the Supplier shall have the right to claim payment subject to the Procuring Entity's own verification of the reason(s) for the failure to issue documents (vii) and (viii) as described in the SCC provision on Delivery and Documents.

**3) For Supply, Delivery, Installation, Test and Commissioning Contracts where Installation, Test and Commissioning prices are included in the supply price:**

- (a) On Contract Effectivity: Advance payment of Fifteen percent (15%) of the total Contract Price shall be paid within sixty (60) days from effectivity of the Contract and upon submission of a claim and an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank for the equivalent amount valid until the Goods are delivered and in the form provided in Section VIII- Bidding Forms.
- (b) On Delivery: Sixty percent (60%) of the price of the **delivered Goods** shall be considered for payment, less the total amount of advance payment, if any and other deductions. If the amount is sufficient to fully recoup the advance payment, the remainder after deductions shall be paid to the Supplier within sixty (60) days after the date of receipt of the Goods and upon submission of the documents (i) through (vi) specified in the SCC provision on Delivery and Documents. Otherwise, the total delivery payment shall be charged against the advance payment and the remaining advance payment will be fully recouped from the succeeding claims.
- (c) On Acceptance: The remaining forty percent (40%) of the price of the **delivered Goods** shall be paid to the Supplier within sixty (60) days after the date of submission of the acceptance and inspection certificate for the respective delivery issued by the Procuring Entity's authorized representative. In the event that no acceptance certificate is issued by the Procuring Entity's authorized representative within forty five (45) days after successful test and commissioning, the Supplier shall have the right to claim payment subject to the Procuring Entity's own verification of the reason(s) for the failure to issue documents (vii) and (viii) as described in the SCC provision on Delivery and Documents

<p>3.2</p>	<ol style="list-style-type: none"> <li>1. The following must be indicated in the performance bond to be posted by the Contractor:             <ol style="list-style-type: none"> <li>i. Company Name</li> <li>ii. Correct amount of the Bond</li> <li>iii. Contract/Purchase Order Reference Number</li> <li>iv. Purpose of the Bond:                      "To guarantee the faithful performance of the Principal's obligation to undertake <u>(Contract/Purchase Order Description)</u> in accordance with the terms and conditions of <u>(Contract No. &amp; Schedule/Purchase Order No.)</u> entered into by the parties."</li> </ol> </li> <li>2. The bond shall remain valid and effective until the duration of the contract <u>(should be specific date reckoned from the contract effectivity)</u> plus sixty (60) days after NPC's acceptance of the last delivery/final acceptance of the project.</li> <li>3. In case of surety bond, any extension of the contract duration or delivery period granted to the CONTRACTOR shall be considered as given, and any modification of the contract shall be considered as authorized, as if with the expressed consent of the surety, provided that such extension or modifications falls within the effective period of the said surety bond. However, in the event that the extension of the contract duration or delivery schedule would be beyond the effective period of the surety bond first posted, it shall be the sole obligation of the CONTRACTOR to post an acceptable Performance Security within ten (10) calendar days after the contract duration/delivery period extension has been granted by NPC.</li> <li>4. Other required conditions in addition to the standard policy terms issued by the Bonding Company:             <ol style="list-style-type: none"> <li>i. The bond is a penal bond, callable on demand and the entire amount thereof shall be forfeited in favor of the Obligee upon default of the Principal without the need to prove or to show grounds or reasons for demand for the sum specified therein;</li> <li>ii. The amount claimed by the Obligee under this bond shall be paid in full and shall never be subject to any adjustment by the Surety;</li> <li>iii. In case of claim, the Surety shall pay such claim within sixty (60) days from receipt by the Surety of the Obligee's notice of claim/demand letter notwithstanding any objection thereto by the Principal.</li> </ol> </li> </ol>
<p>4</p>	<p>The inspections and tests that will be conducted are specified in the Technical Specifications.</p>



SECTION VI

**TECHNICAL  
SPECIFICATIONS**



**SECTION VI – TECHNICAL SPECIFICATIONS**

**PART I – TECHNICAL SPECIFICATIONS**

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## SECTION VI – TECHNICAL SPECIFICATIONS

### PART I – TECHNICAL SPECIFICATIONS

#### TS-1.0 GENERAL

This specification covers the features and technical requirements for Upgrading *the Annunciator, Control, and Protection System of Unit No. 3 at the Agus 2 HEP Plant.*

The control, monitoring, and protection system and power supply shall include new, unused equipment that has passed the manufacturer's quality control for ensured reliable and safe operation of Unit no. 3 at Agus 2 HEP Plant. These shall fit their intended use and comply with all applicable regulations, quality, and standards. The design of these systems/equipment shall consider the specifications of all existing undamaged associated systems/equipment of Unit No. 3 at Agus 2 HEP Plant.

The system to be supplied shall provide reliable and timely process data, status monitoring and operation, alarm handling, historical data storage and retrieval, open communication, flexibility, and protection of people, equipment, and environment capable of meeting the requirements as detailed in this specification. The Supplier must supply all minor items (such as auxiliary relays, terminal blocks, accessories, etc.) that are necessary, although not expressly described in the Technical Specifications, to guarantee the trouble-free operation and ease in the maintenance of the supplied equipment (or parts of the equipment provided) with particular reference to the provisions to be taken into consideration to avoid dangerous or wrong operations.

The Supplier shall accept full responsibility for the full conformance to specifications, documentation, reports, corrosion protection, shop testing, preparation for shipment, warranty provisions, and compliance with the applicable codes and standards and the requirements of this Specification.

#### TS-2.0 SCOPE OF WORKS

The work shall include all equipment, including software necessary for secure and reliable plant operation. The system shall consider provisions for upgrading the control and monitoring of the other units in the plant.

The Supplier shall perform all the works required by this technical specification. It should be noted that the contract includes all and every job and service, although not explicitly mentioned, but is required to fully complete the works ready for operation and dismantle and haul all equipment to be replaced to the designated location.



It shall cover furnishing all equipment, materials, tools, labor, and other necessary incidentals required to upgrade the Annunciator, Control, and Protection System of Unit No. 3 at Agus 2 HEP Plant, which shall generally consist of but not limited to all equipment, materials, and services enumerated herein:

1. Conduct site inspection to verify and assess the extent of the related and incidental works needed to implement the project competently and efficiently;
2. Supply, design, installation, test, and commissioning of the new control, monitoring, protection, and synchronization system in replacement to the existing management, monitoring, safety, and synchronization system of Unit No. 3 at Agus 2 HEP Plant by the technical specifications, and technical data sheets including the associated equipment and appurtenances. The new state of the art microprocessor-based design Control and Protection System shall be for the following:
  - a) Unit 3 Main AC Generator
  - b) Unit 3 Main Power Transformer
3. Supply, delivery, installation, test, and commissioning of the new Distributed Control System (DCS) in replacement of the existing Distributed Control System (DCS) of Unit 3, including the associated equipment and appurtenances. The scope shall consist of but not limited to the following:
  - a) Field Control Unit;
  - b) Marshalling Panel;
  - c) Local Control Panel;
  - d) Protection Panel;
  - e) Human Machine Interface (HMI) Station;
  - f) Engineering Workstation (EWS);
  - g) Sequence of Event (SOE) Manager and Analyzer (Automatic Start-up and Shutdown);
  - h) Surveillance or Monitoring Station;
  - i) Time Synchronization Unit;
  - j) Network Architecture; and,
  - k) Miscellaneous Control and Monitoring Equipment
4. Supply, install, test, and commission the panels completely. These panels must be wholly assembled before delivery to the Agus 2 HEP Plant;
5. Supply, delivery, design, installation, test, and commissioning of new Uninterruptible Power Supply (UPS), wires, plugs, and connectors intended for the upgrading of the control, monitoring, and protection system of Unit 3, complete with all the required appurtenances. The power supply shall be taken from the existing 220 V, 1 $\phi$ , 60 Hz panelboard in the control room of Agus 2 HEP Plant;
6. Formulate/program the logic circuit and the Human Machine Interface (HMI) Station software;

7. Pre-testing and commissioning of the whole system;
8. Conduct of toolbox meeting and safety orientation;
9. Checking of all delivered materials;
10. Supply, delivery, laying, and termination of cables. The process includes but is not limited to termination of the new lines to the panel and the panel-to-panel wires, shutting down of the unit, which shall be in the shortest period possible, disconnection of existing wires from all existing discussions, and termination of these wires on the new board. Installation shall be complete with all the requirements firmly and safely connected and interconnected with operating switches, interlocks, signalization, alarms, and metering instruments to the extent required to put the power plant in satisfactory operating conditions.
11. Conduct training of NPC personnel regarding the hardware/software operation and maintenance of the supplied equipment, including system configuration, setting, and parameterization;
12. Overall testing and commissioning of the whole system; and
13. The Supplier shall provide All other works not specified on the technical specifications necessary for the project's complete and reliable system operation.

In addition, the following shall be provided by the Supplier:

1. Removal/dismantling and hauling of all equipment and materials to be replaced to designated NPC plant stockyard/warehouse area;
2. Supply and delivery of spare parts and consumables as per manufacturer's recommendations to ensure reliable operation of the equipment for at least five (5) years;
3. Supply and delivery of standard and special tools and appliances required for start-up testing, commissioning, operation, and maintenance of the equipment;
4. Provision of services of highly qualified and competent engineers for the direct supervision during the test and commissioning of all supplied equipment;
5. Submission of drawings and documents, i.e., Equipment Manufacturer's drawings, Operation and Maintenance Manuals, Calculation, etc.; and,
6. Provision of technical assistance and services during one (1) year warranty period, such as periodic assessment of the operating condition. This includes all maintenance services to be rendered upon request if any abnormality occurs within the warranty period.

It shall include all and every work and service, although not explicitly detailed herein, but are required to fully complete and make ready the safe and reliable operation of the system.

The Supplier shall have complete system responsibility for the proper design and functioning of the system from installation until system acceptance. The equipment to be furnished shall be done, with all parts in excellent working conditions, of new and high-grade materials, and produced in a first-class satisfactory manner per generally accepted modern engineering practice.

All the system engineering software and online system, materials, and parts, including all the various equipment and devices necessary for instrumentation and control requirements which are not explicitly mentioned herein but are essential for the proper construction, assembly, and operation of the equipment shall be furnished at no additional cost to NPC.

Any damage to existing structures/ facilities incurred during transport, unloading/ mounting, installation, laying of cables, test, and commissioning shall be the Supplier's responsibility.

**TS-3.0 DELIVERY PERIOD AND LOCATION**

The delivery period shall be **ONE HUNDRED EIGHTY (180) CALENDAR DAYS** reckoned from receipt of Notice to Proceed.

The equipment to be supplied shall be delivered to the **Agus 2 HEP Plant, Saguilaran, Lanao del Norte.**

The Supplier shall be responsible for referencing its accessibility, means of transportation, and all other factors that could hamper the smooth execution of the contract.

Any expenses arising through the lack of knowledge of the supplier regarding the existing conditions of the delivery site shall be the Supplier's responsibility, and NPC shall make no additional payment thereof.

**TS-4.0 CODES AND STANDARDS**

The equipment and materials to be furnished shall be designed, manufactured, and tested by, but not limited to, the latest issues of the following codes and standards, including all appendices, in effect at the time of purchase order unless otherwise stated in this specification:

- |   |      |
|---|------|
| 1. American National Standards Institute          | ANSI |
| 2. Institute of Electrical & Electronic Engineers | IEEE |
| 3. American Society for Testing and Materials     | ASTM |
| 4. National Electrical Manufacturers Association  | NEMA |
| 5. Underwriters Laboratories, Inc.                | UL   |
| 6. International Electro-Technical Commission     | IEC  |
| 7. International Standards Organization           | ISO  |



8. Japanese Industrial Standards	JIS
9. Japanese Electrical Standards	JES
10. National Electric Code	NEC
11. Philippine Electrical Code	PEC
12. National Electrical Safety Code	NESC
13. Philippine Electronics Code	PEC

These codes and standards set forth the minimum requirements that may be exceeded by the Supplier if, in the Supplier's judgment and with NPC's acceptance, superior or more economical designs or materials are available for the successful and continuous operation of the Supplier's equipment as required by this specification.

In addition to these codes and standards mentioned, the Supplier shall comply with all National and local laws, codes, regulations, statutes, and ordinances.

Equipment or materials meeting other internationally accepted standards, which ensure an equal or higher quality than the standards mentioned, will also be taken.

In the event of any apparent conflict among standards, codes, or this specification, the Supplier shall refer the dispute to NPC for written resolution before the start of fabrication. The final decision regarding the acceptance of proposed standards is the prerogative of NPC.

No deviation from the accepted standards shall be made after the Contract without the written approval of NPC.

Standards listed in individual technical specifications are used mainly for NPC's references. Other internationally known standards, however, shall also apply, provided such measures are equivalent in all respects to the standard prescribed and to the specific requirements described in the individual equipment specification. Supplier shall submit copies of such standards for NPC's review and approval.

## **TS-5.0 DESIGN REQUIREMENTS**

The design requirements shall have but not be limited to the following:

- a) Distributed Control System;
- b) Field Control Unit;
- c) Marshalling Panel;
- d) Local Control Panel;
- e) Protection Panel;
- f) Human Machine Interface (HMI) Station;
- g) Engineering Workstation (EWS);
- h) Sequence of Event (SOE) Manager and Analyzer (Automatic Start-up and Shutdown);
- i) Surveillance or Monitoring System;
- j) Time Synchronization Unit;
- k) Network Architecture; and,

**l) Miscellaneous Control and Monitoring Equipment**

The Supplier shall prepare programs and turn a complete operational system to NPC. The Supplier's programming and configuration responsibilities shall include but are not limited to the following functions: all plant control system logic modulating control functions, equipment safety, protection and interlocks, man-machine interface functions, operator training for programming functions, and overall system configuration and testing. The Supplier's programming functions shall be performed at the Supplier's facilities. The logic strategy and design for each functional controller and the logic sequences between applicable controllers shall be prepared and installed in the DCS by the Supplier.

The Supplier shall provide all hardware and cabling necessary to provide redundant, fail-safe communications between the subsystems of the DCS.

The construction of the different supply parts must be as standard as possible to reduce spare parts to a minimum and make maintenance and operation easy. All similar parts must be interchangeable.

**TS-5.1 DISTRIBUTED CONTROL SYSTEM****TS-5.1.1 General**

This part specifies the detailed requirements for the design, manufacture, factory wiring, programming, transport, delivery, installation, testing, and commissioning of the Distributed Control System (DCS), which will be the monitoring and control system of Unit 3 Main AC Generator and Unit 3 Main Power Transformer. The control system shall be able to monitor, supervise, and control the unit and desired station auxiliaries, instrumentations, associated valves, and gates under the automatic start-stop control mode of the team. It shall be interfaced and communicated with the control switchboard for the selected control mode of the unit.

All materials and parts shown on the topology and not explicitly mentioned herein but are necessary for the proper erection, assembly, and operation of the equipment shall be furnished at no additional cost to NPC.

The Supplier shall have complete system responsibility for the proper design and functioning of the system from fabrication until system acceptance. All the system engineering software and online systems shall be supplied with precise details. NPC does not intend to specify all the technical requirements nor set forth those requirements adequately covered by applicable codes and standards. Adherence to all applicable regulations and standards is required. The Supplier shall furnish high-quality equipment meeting the needs of this specification and industry standards.

The system shall provide reliable and timely information data and control functions required for the efficient operation of the plant. The needed system

shall have the operational speed, computing power, adequate input/output storage capacity, and self-diagnostic/analysis capability to meet the requirements as detailed in this specification.

### **TS-5.1.2 Design Requirements**

The Distributed Control System shall perform at least the following:

- a) Starting Sequence Control;
- b) Stopping Sequence Control;
- c) Turbine/Generator Protection;
- d) Temperature Monitoring;
- e) Alarm System;
- f) Water Level Monitoring and Turbine Discharge Monitoring (if available);
- g) Dam and Power Intake Control (if available);
- h) Auxiliary Control and Station Service Control;
- i) Switchyard Control;
- j) Data Logging;
- k) Event and Fault Recording;
- l) Synchronizing;
- m) Interlocking; and,
- n) Database Management

The entire plant is monitored and controlled via DCS through the Human Machine Interface (HMI) Station. For the manual control mode of the plant, a control panel shall be provided capable of starting sequence control and stopping sequence control, loading, and unloading as required. Further, hardwired controls are sometimes offered to ensure plant safety and operability during DCS failure.

The system shall allow the operator to make online changes to any analog or digital input point, i.e., adding new topics or deleting an existing issue, including database and application programs.

The system shall be designed to monitor and diagnose its performance and alert and indicate to the operator of any equipment and sub-systems failures. Some checks to be made and trigger an alarm are peripheral failure, I/O failure, peripheral memory error, main memory error and CPU failure to complete the program, scan overruns, controller errors, loss of communication, etc.

Failure of any component in the system shall not cause loss of control of more than one component and must not cause a total system failure.

### **TS-5.1.3 System Architecture Requirements**

The Supplier may offer similar or equivalent system architecture subject to NPC's review and approval.

The DCS shall provide the means of controlling the plant from the station control level and field control unit levels.

Any control action initiated via the DCS from the above control points shall include interlocking and security checks.

The system shall be capable of analog/digital interoperability and seamless integration with different types/models of communication equipment. The system shall be easily expandable.

#### **TS-5.1.4 Station Control Level**

The system computer consoles shall work in redundancy. Any action shall be performed from these computers. Functions shall be available from these computers, such as monitoring the measurement (temperature, power, water level, vibration, etc.), monitoring and controlling the system (start/stop the unit, switchyard operation, gate operation, etc.), curve and trend display, daily and monthly report, etc. The system devoted to plant level shall be implemented on standard multi-task computers to achieve, in parallel, the main functions of event and fault reporting/recording, operation of the plant, data historicization, and overall system configuration and maintenance. The entire plant is controlled and supervised from the Plant Control Level at the Control Room.

The Station Control Level in general, shall include:

- a) A Centralized Control Unit (CCU) shall be included in the System Cabinet for performing control and interlocking functions. It shall be equipped with a redundant station computer. The redundancy shall be based on a pair and spare configuration: both will operate simultaneously, and if one fails, the other will continue the operation independently.
- b) A Marshalling Panel where the field wires are captured and terminated to the terminal blocks. The terminal blocks are cross-wired using system cables to the terminal boards connected to the I/O modules.
- c) A Local Control Panel that can locally and manually control the unit. This panel can be separated or integrated into other boards, including meters, synchronizer, synchro scope, breakers, synchronization switches, excitation ON/OFF, and controls for INCREASE/ DECREASE generator voltage.
- d) A Protection Panel, which is a separate panel for the digital generator protection relay, digital Transformer Protection Relay, and redundant lock-out relays
- e) A Human Machine Interface (HMI) Station, including its accessories, will serve as an operator interface for the Station Control Level from where the plant can be monitored, controlled, and engineered. The HMI shall consist of the following:
  1. An Engineering Workstation (EWS) shall be used as an engineering tool, configurator, and maintenance of the DCS. Logics, control drawings, and graphic pages are created in its database for operation,

monitoring, and control functions. This station shall allow the creation or modification of any DCS databases, including power plant topology and all other maintenance operations and control functions. Therefore, the operator can perform the customization engineering independently without the DCS manufacturer's help for any changes and alterations in the DCS structure.

2. An Operator Workstation (OWS), which provides intuitive, easy-to-understand operating and monitoring environments. It shall have diverse display patterns offering flexibility for various phases of operations and improved operating efficiency. Furthermore, it shall aid in implementing easy-to-understand graphic windows based on ergonomics and knowledge engineering.
3. A Sequence of Event (SOE) Manager and Analyzer shall capture the sequence of events with a time reference of milliseconds. It shall record events for at least 30 days before it will be superseded.
4. A Surveillance or Monitoring Station will display the status of essential parameters, alarms, and tripping for surveillance or monitoring on a 65-inch monitor.
5. At least three (3) units – LED screen-based operator stations. Each operator station shall have a spillproof keyboard and industrial optical mouse. Membrane keyboards are unacceptable. Each LED monitor shall be independent of the other so that failure of any DCS component will not result in an interruption.
6. A Printer Management that allows the system manager to use their HMI for configuring the printers that the DCS will use.

The desktop-type HMI comprises a PC with installed Microsoft Windows and DCS software. The operation and monitoring function of the desktop HMI enables simple operation and monitoring by optical mouse and using the dedicated keyboard.

#### **TS-5.1.5 Field Control Unit Level**

The sub-system devoted to the acquisition function control function at the local control point shall be split into autonomous Field Control Unit (FCU), each ensuring the management of one generating unit.

The FCU is where the logic and control functions are executed. Digital I/O must be included, catering to the low voltage system (AC and DC), medium voltage switchgear, switchyard, transformers, governor system, cooling system, turbine valve hydraulic system, turbine parameters, generator parameters, spillway, and power intake.

The FCU to be supplied for Unit 3 shall be able to have direct connections with all the other subsystems, including the other FCU units to be installed in the



future, via the optical LAN. Its functions shall include but not be limited to the following:

- a) Wired input/output interfacing with substation items and protective relays;
- b) Communication interfacing with relays;
- c) Control and supervision of the complete generator-exciter/turbine-governor set; and
- d) Local automatic sequences.

Each FCU shall be housed in a control cubicle containing all equipment necessary for control and supervision of the complete generator–turbine set as follows:

- a) Power supply module;
- b) CPU module;
- c) Optical Interface module;
- d) IED interface module;
- e) General I/O;
- f) Digital I/O cards;
- g) Analog I/O cards;
- h) Essential pushbuttons;
- i) Necessary auxiliary relays; and,
- j) Terminal strips;

In addition, the necessary RS232 serial interface shall be provided for connecting a portable PC to the FCU to enable local control and monitoring at the local unit level in case the upper level of power has a failure or for downloading the unit module configuration files or for having access to the maintenance dialogue with the equipment.

The FCU unit is responsible for sequence control, alarms, the emergency trip system, temperature supervision, and data transfer to a computer system in the central control station. It comprises principal components and sub-components for safety, sequencing, and generator switchgear control.

These FCUs shall provide high adoption capabilities for establishing direct communication links with the various equipment installed in the corresponding unit, especially with digital protection relays. Each FCU shall interface with all unit devices through digital I/O and analog inputs.

These FCUs shall operate independently of each other and those of the station control level. An outage of a subsystem shall affect and turn off only the pertinent unit or section being controlled and supervised.

The FCU manages the data communication with the central computer system and executes in at least four (4) different software modules with the following functions:

- a) Safety Module
- b) Sequencing Module
- c) Common Unit Control Module

**d) Generator Switchgear Control Module**

The FCU communicates with the computer system at the Station Control Level, sending data from the unit to the computer and receiving orders and set points from the computer. The data transmitted from the team are displayed on the screens in the Station Control Level and logged-in reports.

**TS-5.1.6 Time Synchronization Unit**

For the time synchronization function, a high-quality substation master clock functioning on a GPS signal shall be provided, complete with the required accessories. The synchronization shall be distributed to the CCUs and HMIs through a separate optical LAN in a star configuration.

**TS-5.1.7 Network Architecture**

This comprises communication/network devices that can handle a speed of 1 Gbps.

**High Reliability**

The network shall have dual redundant buses and consist of independent subnets, bus one and bus 2. The control communication shall be performed by using bus 1. However, when a problem occurs in bus 1, the path shall switch immediately and automatically so that the control communication can be performed by using bus 2.

**Real-Time Response**

The network shall implement a dedicated protocol for performing high-quality communication, which is a protocol that is suitable for real-time communication. The transmission scheduling function shall prevent transmission delays and packet loss by preventing packets from accumulating. Real-time response shall be achieved by prioritizing among the different communication types.

**Security**

The network shall take security into account. It shall perform authentication by periodically updating a shared secret key to prevent cyber-attacks such as data eavesdropping, falsification, and spoofing.

**TS-5.1.8 Functional Requirements****Control and Supervision**

The Distributed Control System (DCS) shall be designed to perform but not limited to the following functions described below:

- a) Control system self-monitoring and diagnostic;

- b) Monitor and control the power plant equipment and associated protective relays, as well as supervise all the necessary automatic functions;
- c) display and acknowledgment alarm;
- d) configuration control and maintenance;
- e) generation and editing of the database;
- f) printing and display reports; and,
- g) other pertinent functions as may be recommended.

The standard functions are described extensively, and the description of the wanted task should be enough for a competent company to perform the job in the best engineering sense.

#### Plant Control Level Control Point

In standard conditions, the power plant control shall be performed directly in the Central Control Room. This primary control mode is termed "Plant Control Mode." This system shall contain all functions which constitute the near control of the whole power plant. Visual display units, including appropriate graphic parts, achieve the visualization of the process and the management of the activities. The printer shall complement the screen representation. The optical mouse or function keyboard will select the various parts.

The DCS system architecture shall permit direct data exchange between the subsystem devoted to acquisition and control functions and the subsystem that allows "Plant Control Mode" operations.

The DCS shall provide the means of ensuring that authorized personnel only have access to all the control functions via the DCS control console.

The CPU's operating system (O/S) and design shall be a real-time, multi-user, multitasking operating system based on a universal operating system. Using a state representation, it shall be possible from this level to recognize software and hardware faults anywhere in the station control system.

The central computer shall have an implemented system with a 30% reserve when expanded to maximum future requirements. The verifiable calculations of reserve units shall be submitted, accompanied by supporting documents.

#### Local Unit Control Point

Facilities shall be provided which enable the individual power plant equipment to be controlled by an operator from the switchgear unit control cubicle. These facilities are primarily required during commissioning or routine maintenance operations but may be used to operate the power plant equipment should the higher-level means of control fail.

All control actions emitted from this local unit control point shall be subject to any interlocking requirements with select/execute actions required from the operator.

The power plant equipment status shall be indicated at the Plant Control Point and any relevant alarms.

The design of the Local Unit Control shall be such that the dependability, performance, and operational flexibility for the local unit management will be attained at the highest level.

#### Control Point Management

The operator shall initiate the choice between the "Remote Control Mode" and the "Plant Control Mode" from the DCS control console in the Central Control Room.

For each item of the power station, various control modes are strictly exclusive. Nevertheless, the control mode of each item could be different from the control mode of any other thing: the DCS shall provide configuration capability to ensure the safety of the power plant operation in such a multimode.

#### Alarm Handling

The DCS shall provide alarms on the HMI Station from the major systems, such as the Turbine/Generator and other balance of plant systems. After loop checks, a record of all alarms shall be available in hard copy from the printer. This will include alarm description, time of occurrence, and event returned to regular status. The system shall be configured and designed such that the servers of HMI screens will not be "locked up" during printer operation or sudden bursts of alarms.

The alarm color shall change for acknowledged/unacknowledged alarms. The system shall be capable of automatic alarm cutouts to prevent nuisance alarms or screen cluttering when associated equipment is not in service.

When a process alarm occurs, the operator shall be alerted by an audible tone. A flashing indicator shall also accompany the audible alarm on the LED screen.

#### Logs, Trends, Calculations

The System shall be furnished with periodic and summary logs with an on-demand printout of actual computed or corrected readings of variables, as well as the status of specific major plant equipment. The system shall provide particular logs for "on-demand" printouts of selected group points.

The system shall be furnished with an on-demand printout of the operational log for post-trip review by printing readings of 400 (150 per unit and 100 standard) plant variables and the operator's actions for at least 15 minutes before and five minutes after initiation (20 minutes total).

The system shall furnish a screen depicting equipment operation status and runtime determined by contact closure inputs.

The system shall automatically generate a shift log print-out of 400 hourly averages, maximums, minimums, and totalized flows of Plant process-related data. The plant data balance consists of 150 hourly averages per unit and 100 commons. The turbine parameters to be logged shall consist of the quantity of "reads" transmitted by the serial interfaces. The system shall provide a daily log print-out including daily averages, maximums, minimums, and totals for all trended variables.

The system shall provide for each turbine generator trip log print-out. These logs shall consist of 100 snapshot variables to be automatically collected every 15 seconds and five minutes before and after a turbine trip.

Logs and calculations required for the system include the types listed below, and each shall be addressable.

- a) Equipment total time of operation (run time);
- b) Individual Component efficiencies, such as Generator efficiency, Turbine efficiency, etc.;
- c) Plant gross and net heat rate;
- d) Power used (auxiliary);
- e) DCS Downtime.

The values shall be included in the hourly, shift, daily, weekly, and monthly data log reports but shall not be credited against the 400-tag value stated above.

In performing flow calculations, the system shall be capable of selecting among various differential pressure input transmitters, each covering a portion of the flow range, for optimum accuracy. The Supplier shall be responsible for developing and programming these calculations.

Equipment operating time shall only accumulate when the equipment is determined to be functioning.

Capability for 50 trend logs shall be provided. Each shall contain a list of values for up to 12 points. Data collection intervals shall range from one collection per minute to one group per 24 hours. Based on plant reporting needs, the total collection period for a trend log shall vary, with a maximum collection period of 120 days. Automatic printing shall occur at the end of the data collection period, the end of a shift or day, or upon the operator's demand.

#### LED Display

This section defines the minimum information available on the various HMI console LED displays. All displays shall be accessible from any consoles in the same communication link system. Color displays shall be furnished. The keyboards of the consoles shall be identical.

At least the following major types of graphics are to be provided:

- a) Index (Menu) Display;
- b) Facility Overview Display;
- c) Loop Display;
- d) Alarm Summary Display;
- e) System Diagnostic Display;
- f) Historical Trend Display;
- g) Control Face Plate Display; and,
- h) Trend Display.

All graphic variables shall be dynamic to reflect operating status, alarms, lousy quality, and loss of communication.

The average custom graphic display shall have a combination of 75 dynamic text, shapes, and analog values. The plant operator shall be able to monitor and control the unit by using these LED graphic displays. The graphic shall be clear and concise with operator control in mind. Pictures shall be linked to each other such that the startup/shutdown of a plant can be performed smoothly.

#### **TS-5.1.9 Spare Parts and Special Tools**

The Supplier shall furnish spare parts for five (5) years of operation. The cost thereof shall be included in the price of the system.

The Supplier shall also provide a list of recommended spare parts identifying each one and the sub-assembly to which it applies. The Supplier shall indicate the expected life of the parts requiring replacement and the minimum recommended spare parts inventory for installation, start-up, continuous operation, and maintenance. The Supplier shall state whether the recommended spare parts are a stock item or a particular item and shall furnish the name and location of the nearest supplier and the approximate lead time required for delivery.

All special tools necessary for the installation, start-up, operation, maintenance, and adjustment of the equipment and accessories shall be furnished by the Supplier. The Supplier shall provide a list of supplied special tools, identifying each tool's function and the specific items for which it is used. The Supplier shall also indicate whether the devices are required for installation, start-up, operation, maintenance, or adjustment.

The Supplier shall submit a complete priced parts listing for the equipment, which shall cross-reference all supplier or Sub-vendor assigned part numbers back to the original manufacturer's part number. The Supplier shall notate quantities of these items recommended and required by NPC for continuous operation during the normal overhaul cycle. The recommended Spare Parts List shall include items requiring replacement.

The parts list shall include cross-sectional or assembly-type drawings, part numbers, materials, and estimated delivery lead times. The part number shall identify each part for interchangeability purposes. The part listing and

recommended spare parts lists shall be provided to NPC promptly upon the Supplier's receipt of approved drawings.

#### **TS-5.1.10 Shop Test**

##### Type Test

The manufacturer of the Distributed Control System shall perform a comprehensive type test and provide a Type Test Certificate in compliance with international standards on the prototype of the associated or peripheral equipment to be used in the system to confirm the adequacy of their design and operational stability. The test shall include all the necessary tests stipulated by IEC Standard and other standard tests done by the manufacturer, such as the following:

- a) Power frequency voltage withstand test;
- b) Impulse voltage withstand test;
- c) High-frequency interference;
- d) Surge withstand capability;
- e) Thermal withstand capability;
- f) Temperature dependency;
- g) Temperature rise test;
- h) Power consumption test;
- i) Operation and function test;
- j) Others.

Certified test certificates from official independent laboratories may be accepted instead of the performance of the type tests. Type test certificates shall be submitted for approval at the same time as the main design details of the equipment or system are offered.

##### Routine and Quality Conformance Test

Per IEC Standards, routine and quality conformance and other necessary tests shall be performed.

The Supplier shall prepare for tests, provide the test apparatus and personnel, and notify NPC of the test date **FORTY-FIVE (45) calendar days** in advance.

Before shipment to the job site, but upon completion of system fabrication, software implementation, and documentation reflecting the current system, the Supplier shall perform a factory acceptance test to the satisfaction of NPC. Successful completion of such a test is a prerequisite for system shipment. Before the demonstration test, the System's design shall incorporate the latest changes applicable to the NPC's equipment. The tests shall include all reasonable exercises that the combination of equipment and software can perform. The complete system shall be present and assembled for this test.

NPC's acceptance shall be based upon the results of the Supplier's demonstration of the system to NPC's complete satisfaction. The system fully

complies with specifications/design input for each task and is ready for field loop tests. All punch list items shall be incorporated and reconciled. Should NPC reject the system, the DCS system shall not be permitted to be shipped from the factory or moved to storage.

#### Closed Loop Simulation

Closed Loop simulation shall allow NPC to verify that the logic configuration meets the design intent and adequately functions.

#### Test Reports

One (1) electronic copy (DVD format) and **FIVE (5) COPIES** of test reports of all standard tests performed after the date of award and all routine tests shall be certified by the inspector and submitted to NPC within **FIFTEEN (15) CALENDAR DAYS** after the test.

### **TS-5.1.11 Data and Documentation Requirements**

The following documents shall be submitted after the award of the contract for NPC's review and approval before procurement and installation of the supplied equipment and materials:

- a) Complete shipping and assembly drawings showing the Supplier's identification, plans, elevation and section views, mounting dimensions and details, weights, and cable entrance openings;
- b) Complete system architecture for the DCS, identifying its components;
- c) Complete description of the functions and technical specifications of each of the following principal components of the DCS;
  1. Central Control Unit,
  2. Station Control Unit
    - Operation Human Machine Interface (HMI) Station;
    - Plant and Switchyard Sequence of Event (SOE) Manager;
    - Engineering Workstation (EWS) computer;
    - Function Keyboard and Optical Mouse;
    - Printer Management.
  3. Local Area Network (LAN)
- d) Detailed system architecture arrangement drawings showing the layout inside the control room, complete with the required furniture for the DCS;
- e) Complete description of the following:
  1. Environmental Data;
  2. Failure behavior;
  3. Plant and Switchyard protections;
  4. Plant and Switchyard Interlocking;
  5. Generator and Transformer parallel operation scheme;
  6. Modules:
    - Input/output,
    - Analogue/digital,
    - De-coupling,



- Programmable translator.
7. Communication;
  8. System software;
  9. Protection remote setting and disturbance analysis software;
  10. Catalogue and operating characteristic detail for all equipment;
  11. Functional requirements, including control (manual & automatic), display, alarm, etc.;
  12. Power supply system and arrangement,
  13. Earthing details.
- f) Detailed bill of materials and parts list for the DCS;
  - g) Details of DCS connections with various equipment;
  - h) Detailed logic and schematic diagrams, wiring diagrams including connection points for all external connections;
  - i) General assembly and erection/installation drawings and procedures;
  - j) List of drawings and schedule of submittals;
  - k) Detailed schematic diagram and cabling layout;
  - l) Routine Test reports;
  - m) Detailed test procedures of the equipment and field test reports;
  - n) Instruction, maintenance, and operation manuals;
  - o) List of codes used;
  - p) Final Technical Data Sheets conforming to the specification;
  - q) As-built drawings as finally approved.

## **TS-5.2 PROTECTION RELAY SYSTEM**

### **TS-5.2.1 Protective Relays**

All protective relays shall be utility-grade numerical or microprocessor-based. The necessary test devices shall be incorporated within the relays.

The relay cases shall be semi-flush, rectangular, back-connected, dust-tight switchboard type. The points shall be provided with removable covers with windows and means for sealing against tampering. The relays shall conform to the applicable requirements of IEEE C37.90 or equivalent IEC Standard. "Relays and Relay Systems Associated with Electric Power Apparatus." Each protective relay shall be practically free from errors caused by normal variations in frequency, waveform, power factor, and ambient temperature effects between 5°C and 50°C. All current coils shall withstand 35 times the average coil rating for 0.5 s, and all potential locks shall be able to withstand 10% excess average voltage continuously without damage to the coils or equipment.

Each relay shall have at least one circuit-closing contact suitable for 110-V DC ungrounded service. Where more than one electrically independent relay contact circuit is required, and it is not feasible to provide more than one such circuit, or if the two circuits are available but are not electrically independent, suitable auxiliary relays shall be furnished to provide the required additional circuits. The relay contacts shall be of high-quality, non-oxidizing material. Time-delay features depending upon oil dashpots or other devices that are appreciably affected by temperature will not be accepted. Each relay shall have an operation indicator and an external target reset device. The relay shall

be complete with all operating auxiliaries, including auxiliary transformers, as required to adjust currents and potentials for amplitude and phase angle to operate all relays appropriately supplied.

External auxiliary equipment furnished as part of the relays shall be mounted in compact assemblies for back-of-panel mounting. The protective relays and auxiliaries shall be suitable for operation with the instrument transformer ratios and connections shown on the one-line diagram. Relay contacts indicated ordinarily open or closed refer to the contact position when the relay coil is de-energized. The Supplier shall furnish, as part of the drawings, computations showing the complete settings to be made in the field of each protective relay.

#### **TS-5.2.1.1 Generator Protection Function**

The Generator Protection Relays shall consist of but not limited to the following:

a) **Generator Differential Relay (87G)**

Generator differential relay shall be high speed, variable percentage differential type, 3-phase. Relays shall have slope characteristics of approximately 10%, increasing rapidly above about twice the average current. The relays shall be unaffected by DC transients associated with symmetrical short-circuit currents.

b) **Generator- Transformer Differential Relay (87GT)**

Generator- Transformer Differential Relay shall function as backup protection of both the generator and transformer from the effects of internal faults.

c) **Generator Overcurrent Relay with Voltage Control (51V)**

Generator Overcurrent relays with voltage control shall be single-phase induction types with inverse time characteristics.

d) **Generator AC Overvoltage/Undervoltage Relay (59G/27G)**

Generator AC over-voltage relay shall be single-phase, frequency-compensated, induction type with very short time characteristics and instantaneous trip units for high overvoltage.

e) **Generator Stator/Rotor Ground Fault Relay (64S/64R)**

Generator stator ground fault overcurrent relays shall be single-phase induction type.

f) **Negative Phase Sequence Relay (46)**

Generator negative phase sequence relay operating characteristics shall closely match the  $I^2t$  thermal curve of the protected generator.

g) Generator Temperature Overcurrent Relay (49G)

The relay shall operate with current transformers and standard 100-ohm resistance temperature detectors embedded in the generator stator wind bearings.

h) Loss of Excitation Relay (40G)

Generator loss of field relay shall provide 3-phase protection for the generator and the power system for loss of general tor excitation. It shall be of the directional distance type suitable for open delta-connected potential transformers.

i) Voltage Balanced Relay (60G)

The voltage balance relays shall detect a blown fuse in the potential transformer circuit.

j) Reverse Power Relay (32)

The relay shall protect the generator against motoring. The relay shall have an adjustable current setting.

k) Over/Under Frequency Relay (81)

The relay trips the generator to an off-line mode to protect the generator against damage because of the rate of change of frequency, such as overheating, vibration, etc.

**TS-5.2.1.2 Transformer Protection Relay Function**

The Transformer Protection Relays shall consist of but not be limited to the following:

a) Differential Relay (87T)

The transformer differential relays shall be of the percentage differential type with three restraint circuits. The relay shall be suitable for protecting a 3-phase, generator step-up transformer as shown on the Drawings and shall provide positive protection against tripping or magnetizing inrush current. Any unique accessories required for testing or setting the relay shall be furnished with the relays. If needed, auxiliary current transformers or current balancing autotransformers shall be provided to operate the relays properly.

b) Over fluxing Relay (59F)

The transformer overvoltage relay shall be a single-phase, frequency-compensated induction type with very short time characteristics and instantaneous trip units for high overvoltage.

c) Neutral Ground Relay (51NT)

Power transformer neutral ground relay shall be single-phase inverse time, overcurrent induction type, with instantaneous element.

d) Instantaneous and Time Overcurrent Relay (50/51T)

The transformer overcurrent relays shall be non-directional, induction type, with instantaneous attachment.

e) Instantaneous and Time Ground Overcurrent Relay (50/51N)

The transformer ground over current relay shall be a residual ground overcurrent non-directional, induction type, with instantaneous attachment.

### TS-5.2.2 Synchronizing Equipment

Synchronizing equipment shall be furnished complete with all necessary auxiliaries. It shall operate with a single phase, 60 Hz, potential source, and available plant DC control power supply.

#### Manual Synchronizing

Manual synchronizing shall be using the synchronizing instruments furnished with the control switchboard, the closing of the generator breakers by their manual control switch with the synchronizing switch in the manual position.

#### Automatic Synchronizing

Automatic synchronizing of the generator shall be done by operating the synchronizing equipment from the unit start switches with the breaker synchronizing switch in the "Auto" position.

a) Automatic Synchronizing Equipment (15A)

Automatic synchronizing equipment shall be a solid state type consisting of an automatic synchronizer, voltage acceptor, voltage matcher, matcher, and synchro acceptor. Synchronizing equipment should be an added function of the Generator Protection Relay.

### TS-5.2.3 Data and Documentation Requirements

The following documents shall be submitted after the award of the contract for NPC's review and approval before procurement and installation of the supplied equipment and materials:

- a) List of drawings and schedule of submittal
- b) Final Technical Data Sheets of the equipment conforming to the specifications
- c) Outline drawings of the protection relay system and associated accessories showing all critical dimensions and weights, including the following:
  1. Mounting dimensions and details and transport dimensions
  2. Plans, elevation, and sectional views
  3. Details of mounting and anchoring to existing/available floor space area
  4. Control and power cable entrance opening
  5. Details of main terminals and grounding connections
- d) Schematic diagrams for control and protection, including interlocking scheme:

**Note:** *Control circuit diagrams indicating the interfacing with the DCS for the above items shall also be provided if substation supervisory control and monitoring functions are through the DCS.*

- e) Instruction, maintenance, and operation manuals.
- f) The final design short circuit strength and arc-flash calculations, including basic equations and reference to the literature
- g) Routine test reports
- h) Field test to be performed and field test reports
- i) As-built drawings are finally approved

### **TS-5.3 POWER SUPPLY**

#### **TS-5.3.1 Uninterruptible Power Supply**

##### **TS-5.3.1.1 General**

This section specifies the technical and associated requirements for designing, manufacturing, installing, and testing static uninterruptible power supply (UPS) for hydroelectric power generating stations.

##### **TS-5.3.1.2 Technical Requirements**

###### **TS-5.3.1.2.1 Design Requirements**

The data, rating, and requirements listed below shall be the basis of the Supplier's performance guarantee.

The UPS system should provide 100% protection for all its load. In all respects, equipment shall incorporate the highest quality of modern engineering design and workmanship with 20 years of expected design life.

The Supplier shall supply an industrial design UPS. The system will provide power to an uninterruptible AC panel carrying loads such as the plant-distributed control system, emergency lighting, critical electric drive/actuators, and programmable controllers.

All components shall be of an industrial standard with a level of quality and reliability that satisfies the requirements of a secure AC source of power to vital equipment performing a controlling, monitoring, and safeguarding function in continuously operating process units and utility installations.

All components shall be capable of withstanding the thermal and dynamic stresses resulting from internal and external short circuits, circuit switching operations, etc. Damage arising from component failure should be confined to the component concerned.

Protection against direct contact (typically live parts) must be ensured by enclosures having an IP50 degree of external protection and IP 20 internal protection. Protection against indirect contact (parts made live by earth faults) must be afforded by earthed equipotential bonding and automatic supply disconnect.

#### **TS-5.3.1.2.2 Modes of Operation**

The UPS module shall be designed to operate as a double conversion, on-line reverse transfer system in the following modes:

a) Normal

The inverter shall continuously supply power to the critical load. The rectifier/battery charger shall derive power from the standard AC source and supply DC power to the inverter while simultaneously float charging the battery.

b) Emergency

Upon failure of the standard AC power source, the critical load shall be supplied by the inverter, which, without any switching, shall obtain its power from the battery.

c) Recharge

Upon restoration of the regular power source (before complete battery discharge), the rectifier/battery charger shall power the inverter and simultaneously recharge the battery.

d) By-Pass Mode

The static by-pass transfer switch shall transfer the load to the by-pass without interrupting the critical power load. This shall be accomplished by

turning the inverter off. Automatic re-transfer or forward transfer of the load shall be completed by turning the inverter on.

e) **Maintenance By-Pass/Test Mode**

A manual make-before-break internal maintenance bypass switch shall be provided to isolate the UPS inverter output and static by-pass transfer switch for maintenance. This shall allow the UPS to be tested or repaired without affecting load operation.

**TS-5.3.1.2.3 Rectifier/Battery Charger**

The microprocessor-based thyristor rectifier/battery charger shall be compatible with its associated battery and inverter (charger and inverter shall be microprocessor). The capacity shall be enough to carry the entire load requirements of the inverter and recharge the battery simultaneously at a current rated 10% of the battery nominal capacity for Lead acid battery and 20% of the battery nominal capacity for Nickel Cadmium battery.

The rectifier/charger shall provide high-quality DC power to charge the batteries and power the inverter and shall have the following characteristics:

a) **Modular Assembly**

The rectifier/battery charger assembly shall be modular to facilitate rapid maintenance.

b) **Input Power Factor**

The rectifier/battery charger shall have a 0.85 minimum power factor.

c) **Input Harmonic Current Suppression**

The rectifier/battery charger shall produce a sinusoidal input AC with low harmonic content on each phase, limiting THD on the UPS input below 33%.

d) **Input Current Limiting**

The rectifier shall be provided with current limiting means and capable of delivering the current limit continuously without damage. The UPS shall be equipped with a system to limit the battery recharge current required by a particular battery.

e) **Charging Levels**

The battery charging circuitry shall be capable of being set for automatic battery recharge operation, float service, manual battery charge service, and equalizing or commissioning operation.

f) Temperature Compensated Charging

The battery charger shall be equipped with a temperature probe to enable temperature-compensated charging and adjust the battery float voltage to compensate for the ambient temperature using a negative temperature coefficient of 3mV per cell degree Celsius at a nominal temperature of 25°C.

g) Capacity

The rectifier/charger shall have enough capacity to support a fully loaded inverter and fully recharge the battery to 95% of its total capacity within 6-8 hours.

h) Voltage Variation

The rectifier/charger shall maintain a rated output voltage within  $\pm 1\%$  from no load to full load, with AC input variations of  $\pm 10\%$  nominal.

i) Operation

The rectifier/charger shall suit an ungrounded (DC output) operation. It shall be capable of operation while disconnected from the battery.

#### TS-5.3.1.2.4 Inverter

The UPS output shall be derived from a Pulse Width Modulated (PWM) inverter design. It shall be capable of providing the precise output power characteristics specified in the technical data sheet while operating over the battery voltage range.

The inverter assembly shall be constructed as a modular assembly to facilitate rapid maintenance.

Frequency shall be synchronized with the frequency of the incoming power under normal conditions and stabilized to within  $\pm 0.5$  Hz during interruptions of incoming energy.

Inverter output shall be frequency and phase synchronized to the power station's AC system. Interlocking shall prevent the transfer from the inverter output to bypass the supply manually without synchronizing the two. Indication of synchronism shall be provided on the UPS control panel.

A fuse shall protect the inverter. Reserve static switch thyristors shall be covered with high-speed fuse to protect them from damage by short circuits or excessive overloads.

#### TS-5.3.1.2.5 Static By-Pass Switch



A static switching type transfer switch shall be included. The controller shall be a completely solid-state circuit, rated for continuous 100% duty, capable of sensing a system malfunction and automatically transferring load to the system bypass line in ¼ cycle or less on a make-before-break basis; a contactor is not allowed. The switch shall have a time delay to prevent immediate switching back to the inverter after automatic transfer to the bypass source.

The static bypass transfer switch shall automatically cause the bypass source to assume the critical load without interruption after logic senses one of the following:

- a) Inverter overload exceeds the unit's capability
- b) The battery autonomy period expired, and bypass current is available
- c) Inverter failure

If the bypass source exceeds the below conditions, the UPS shall make an interrupted transfer (around 20 m sec.)

- a) By-pass voltage greater  $\pm 10\%$ , - 10% from the UPS rated output voltage
- b) By-pass voltage greater  $\pm 2\%$ , from the UPS rated output frequency

The static by-pass transfer switch shall automatically forward transfer power from the bypass to the rectifier/inverter, without interruption, after the UPS inverter is turned "ON" after an instantaneous overload-induced reverse transfer has occurred and the load current returns the UPS nominal rating or less. Retransfer back to inverter output shall be automatic when conditions are expected and the work of the inverter is synchronized with the bypass source.

The static by-pass transfer switch shall have the following overload characteristics, after which a thermal protection device shall engage to protect the static by-pass.

A manual bypass make-before-break switch shall take the inverter and static control out of service for repairs or inspection without disturbing the load. The controller shall permit operation from either the bypass source or the inverter. The system shall include an asynchronous signal to the inverter. /

- a) 100% of UPS output rating for ten milliseconds
- b) 150% of UPS output rating for 1 minute

A manual bypass make-before-break switch shall be provided to take the inverter and the static control out of service for repairs or inspection without disturbing the load. The controller shall permit operation from either the bypass source or the inverter. The system shall include a synchronizing signal to the inverter. The manual transfer switch shall transfer from bypass to normal with a synchronizing sign to test the inverter for such synchronism before the uninterruptible AC bus is connected to the inverter. A bypass switch shall be provided.

**TS-5.3.1.2.6 Microprocessor Controlled Logic**

The entire UPS operation shall be provided using microprocessor-controlled logic. All functions and parameters shall be firmware-controlled, thus eliminating the need for manual adjustments or potentiometers. The reason shall include a self-test and diagnostic circuitry such that a fault can be isolated down to the printed circuit assembly or plug-in power assembly level. Every printed circuit module or plug-in power module can be monitored.

Diagnostics and configurations of the UPS shall be possible via a PC through the local communication port on the UPS or remotely through DCS having the computerized control system.

**TS-5.3.1.2.7 Standard Communication Panel**

The UPS shall include as a standard feature an easy-to-use communication panel. Include a backlit, color graphic animated LCD, LEDs, and audible indicators for UPS regular operation, UPS fault, UPS on battery or reserve, and UPS warning. The UPS communication panel shall include rectifier "ON"/ "OFF" and inverter "ON"/ "OFF" pushbuttons that will permit the operator to safely command the UPS on or off without risk of load loss.

**TS-5.3.1.2.8 System Controls and Indicators****Front Panel LCD Display**

The UPS control panel shall provide a display indicating UPS status, metering, battery status, alarm event log, and advanced operation features. The presentation shall give access to the following:

- a) An animated, mimic diagram indicating UPS power flow
- b) Measurements, status indications, and events
- c) Personalization menu protected by a password, used to make specific settings

The visual display shall display the following system parameters based on accurate RMS metering:

- a) Measurements
  1. Input voltage (phase to phase)
  2. Input current phase
  3. Input frequency
  4. Bypass voltage
  5. Bypass input frequency
  6. UPS output voltage (phase to neutral)
  7. UPS output current per phase
  8. UPS output frequency
  9. UPS output % of current per phase
  10. UPS output kVA
  11. UPS output kW
  12. DC voltage

- 13. Battery current
- 14. Battery backup time
- 15. Battery temperature

b) Status Indication and Events

- 1. Load on battery (discharging)
- 2. Load on UPS
- 3. Load on automatic bypass
- 4. Low-battery voltage warning
- 5. General alarm
- 6. Battery fault
- 7. Battery autonomy time during operation on battery power
- 8. Internal fan failure
- 9. Bypass source outside tolerances
- 10. Battery temperature
- 11. Any additional indication which shall provide maintenance assistance

The UPS shall be capable of handling time-stamped historical events. This function shall timestamp and store all critical status changes, anomalies, and faults, and this information is available for automatic or user-requested consultation. It shall interpret the events and indicate remedial measures if possible.

LCD Status Indications

The UPS control panel shall provide LED's or any equivalent indicating means whichever is more appropriate that would signal the following status conditions:

Green Led	UPS normal operation
Orange Led	Minor fault
Red Led	Major fault: load not protected

**TS-5.3.1.2.9 On/Off Switch**

The UPS shall have an ON and OFF pushbutton, which can start and stop the charger and inverter. It shall be possible to remotely activate the OFF function via an isolated dry contact to create an emergency power-off function, resulting in the following:

- a) Inverter shutdown
- b) Opening of the automatic bypass
- c) Opening of the battery circuit breaker
- d) Opening of the isolated dry contact on the programmable relay card

**TS-5.3.1.2.10 Audible Alarm Set**

The UPS shall have an audible alarm that can be stopped locally and remotely using the user interface. Provisions shall be made such that if a new notice is



sensed after the original alarm has been acknowledged, it shall reactivate the audible alarm for a recent fault/disturbance occurrence.

#### **TS-5.3.1.2.11 Emergency Power Off**

The UPS shall be equipped with a local emergency power-off button and dry contact input that can be used to command UPS shutdown remotely. Activation of this command shall lead to the following actions:

- a) Inverter shutdown
- b) Opening of the static bypass and the battery circuit breaker
- c) Opening of an isolated dry contact on the programmable relay board

#### **TS-5.3.1.2.12 Dry Contact**

The UPS shall be provided with a programmable input/output relay board. This board shall contain ten (10) dry contacts, i.e., eight (8) for input and two (2) for output signals. Connections shall be programmed as follows:

- a) UPS online
- b) Load on bypass
- c) UPS on battery
- d) UPS on battery low
- e) General Alarm
- f) Remote UPS on (input)
- g) Remote UPS off (input)

The contacts shall be ordinarily open and changed to indicate the operating status.

#### **TS-5.3.1.2.13 Mechanical Design Temperature**

##### Enclosure

The UPS shall be housed in a freestanding enclosure with dead-front construction. The structure of the UPS shall be sufficiently strong and rigid to withstand handling and installation operations without risk.

The sheet metal elements in the structure shall be protected against corrosion by a suitable treatment, such as zinc electroplating, bi-chromatin, epoxy paint, or equivalent. Cabinets shall be pre-treated for corrosion protection.

All modules, etc., shall be inspectable and removable from the front of the cabinet (hinged panels open) without requiring access to the rear of the cabinet. A copper ground bus shall be provided in the cabinet with a compression-type connector for connection to the copper grounding cable.

##### Cable Access

The UPS shall be able to accommodate bottom entry cables.

### Battery

The UPS module shall use a battery system for auxiliary power service in a UPS application.

The battery shall have an impact-resistant plastic case and be housed in rack-out containers inside the UPS module.

The UPS shall be equipped with a device designed to protect the battery against deep discharge depending on discharge conditions with isolation of the battery by a circuit breaker. A monitoring device shall adjust the battery shutdown voltage as a function of a discharge coefficient to avoid excessive discharge at less than the rated output. A second device shall prevent self-discharge of the battery into the UPS control circuits during an extended shutdown.

The battery system shall be provided with a battery self-test or battery monitoring system, which shall be able to perform the following automatic functions:

- a) Battery circuit checks every twelve (12) hours
- b) Open-circuit battery test once a month
- c) Partial discharge tests every three (3) months

This self-test system shall signal faults via LEDs on the front panel or a message to remote supervision systems.

#### **TS-5.3.1.2.14 Other Accessories of the UPS**

##### Input Isolation Transformer

An input isolation transformer shall be provided for the UPS to isolate the rectifier input and DC bus for ungrounded DC systems. Its rating shall equal the maximum output of the inverter plus the necessary capacity to recharge the battery. The isolation transformer shall be provided in the UPS enclosure.

##### UPS Distribution Board

The UPS Distribution Board shall be designed to receive power from the UPS and supply power to the computer peripherals, if any, for microprocessor-based substation control and to all loads requiring the services of the UPS.

Each output of the distribution board must be fitted with a circuit breaker providing overload and short circuit protection. An input circuit breaker shall protect the Distribution Board itself.

The Distribution Board shall be designed so that the output circuits can be added or modified without shutting down the rest of the installation.

Since interference cannot be avoided in the system, an isolating transformer shall be provided with the Distribution Board to guarantee interference protection of the computer loads.

A mimic panel shall be provided with the distribution center, which gives the following digital display and readings:

- a) input voltage
- b) output voltage
- c) output currents
- d) power
- e) frequency
- f) earth leakage current
- g) percent load

#### External Control and Communication Devices

The UPS shall be provided with the following control and communication devices:

- a) RS232 Serial Communication Card: The RS-232 serial communication card shall provide registers for all alarms and standard measurements available on the UPS. The port shall be able to adapt to the DCS protocol.
- b) RS485 Serial Communication Card: The RS-485 serial communication card shall provide registers for all alarms and standard measurements available on the UPS. The port shall also be able to adopt with the port shall be able to adopt with the DCS protocol to be used.
- c) SNMP Interface: The communication port shall accommodate an SNMP (Simple Network Management Protocol) converter to allow the acquisition of all UPS status points via SNMP protocol to monitor the UPS via the DCS or direct connection to a PC. The SNMP adapter shall also allow for a straightforward interface with a computer network via a standard RJ-485 Ethernet network connection.

#### Two Three Circuit Breaker External Maintenance Bypass in Matching Cabinet

The UPS shall have a maintenance bypass for two (2) or three (3) circuit breakers mounted in a matching cabinet to provide a wraparound bypass configuration for total UPS isolation during maintenance. Maintenance bypass transfers shall be without interruption and kirk-key interlocked to protect the UPS from damage in the event of out-of-sequence transfers.

#### Network-Based Power Management Software

All software mentioned on any manual and expected to be used for some activities of the UPS, i.e., compiler, linker, database, editor, tools, etc., shall be supplied as part of the scope of supply of the UPS. All the special connection cables, interface boards, or cards necessary for using the software shall also be included in the area of supply.

The UPS software shall use a distributed, TC/IP-based architecture and be SNMP manageable.

Principally, this software is divided into installation-related and operator-dependent software. Any change and handling of the total software will be possible for the operator without previous knowledge of this software. It should be modular, where each module must be consistent inside itself. A further implementation of modules shall be possible.

The functionality of each software module must be supervised. This supervision aims to come to a stable and defined end position in case of a fault on the UPS. A clear, self-explaining fault announcement must follow spots on the modules. An extensive HELP utility with all the information contained in the manuals in online mode shall be provided in all the programs.

It must be assured that in case of a new software version, all the data, parameters included, remain without limitation on the system. All the function units of the previous version will rest available in their total availability.

All the programs used shall be provided with a defined version number. Every upgraded version shall be compatible with all the previous versions delivered with the original.

#### Seismic Anchor

To keep the UPS from moving during an earthquake, the Supplier shall provide a clamping device fixed to the foundation. The bolts for this clamp will be embedded in the concrete foundation so that the UPS, when appropriately positioned, may be selected securely. The UPS can be set to or unfastened from these bolts as desired.

#### Dual Input

A second input terminal block shall accommodate a separate input source.

#### Nameplate

Nameplates shall be satin finish white phenolic with black core and beveled edges, 2 mm thick; letter shall be at least 6 mm high. Nameplates shall be attached with corrosion-resistant screws to each cabinet front panel for identification.

#### Wiring and Components

Control wiring shall be 600V, 2.0 mm<sup>2</sup> minimum, seven-strand SIS, copper wire with heat, moisture, and flame-resistant cross-linked polyethylene insulation by ICEA-S-66-524 or equivalent IEC standard. Where flexibility is required, 19 strands of wire shall be used. Wire markers shall be used on both ends of all cables.

All wiring shall be protected against contact with sharp edges, neatly bundled, and secured with wire ties. Wire shall be continuous; no splicing is permitted.

Terminal lugs shall be compression-type with insulated sleeves and ring-type or locking fork-type tongues. Terminal blocks shall be screw-type. Terminal blocks for external connections shall be rated at 600 volts, ten amps (minimum).

In the Supplier's internal wiring, no more than two wires shall be connected to one terminal block point. Not more than wire shall be in any terminal lug.

Adequate space shall be provided on both sides of the terminal blocks for connecting wires and for wire markers. To allow for stripping and bending of incoming cables, terminal blocks for external connections shall be located a minimum of 200 mm away from cable entrances.

A minimum of ten (10) percent spare terminal points shall be available in each cabinet. The same compression connectors shall be provided to terminate external AC and DC cables.

#### **TS-5.3.1.3 Test**

The Supplier shall carry out at his own expense all tests necessary to ensure the satisfactory design and manufacture of the uninterruptible power supply system by ANSI or equivalent IEC Standards.

The Supplier shall make all preparations for the test, provide the test apparatus and personnel, and notify NPC of the date of the test forty-five (45) days in advance. NPC reserves the right to witness all the routine and quality Conformance tests unless waived in writing.

All materials and equipment shall comply with test criteria, and NPC's acceptance of the equipment shall not relieve the Supplier of the responsibility for meeting this specification's requirements. Although the Supplier performs the required test and the equipment meets the acceptance criteria, he shall not be relieved of the responsibility of providing equipment conforming to this specification's requirements.

#### **TS-5.3.1.4 Data and Documentation Requirements**

The following documents shall be submitted after the award of the contract for NPC's review and approval before procurement and installation of the supplied equipment and materials:

- a) Outline drawings of UPS and accessories showing all critical dimensions and weights, including the following:
  1. Overall dimensions



2. Mounting dimensions, including location and size of anchor bolt holes, including base drilling plan
  3. Plans, elevation, and sectional views
  4. Detail layout of cabinet with racks and modules
  5. Control and power cable entrance openings at the cabinet
  6. Details of main terminals and grounding connections
- b) Complete description of the functions and technical specifications of each of the components of the UPS
  - c) Type, catalog designation, and description of significant components furnished by the Supplier
  - d) Installation details and foundation requirements, loads, and fastening details;
  - e) Detailed material list and part list for the UPS
  - f) Detailed functional diagram, schematic diagram, panel wiring diagram, terminal block diagram and cabling layout
  - g) Details of UPS connections with various equipment
  - h) Protection and alarm monitoring scheme
  - i) Complete design calculations
  - j) General assembly and erection/installation drawings and procedures.

**Note:** *Control circuit diagrams indicating the interfacing with the DCS for the above items shall also be provided if substation supervisory control and monitoring functions are through the DCS.*

- k) List of drawings and schedule of submittals
- l) List of codes used
- m) Final Technical Data Sheets conforming to the specification
- n) Detailed Contract Schedule Activity for the UPS
- o) As-built drawings as finally approved.

#### **TS-5.4 POWER/CONTROL/INSTRUMENTATION CABLES**

##### **TS-5.4.1 General**

This part specifies the detailed requirements for the manufacture, delivery, installation, test, and commissioning of high voltage, medium and low voltage, power, control, and instrumentation cables, including all termination, fixing, and mounting materials for the rehabilitation works.

##### **TS-5.4.2 Technical Requirements**

###### **TS-5.4.2.1 General**

Cables shall be suitable for operation in systems where continuity of supply is the first consideration. They shall also be satisfactory for operation under the atmospheric and climatic conditions prevailing at the site and under such variations of current, voltage, and frequency as may be met under all system operating conditions.

The Supplier shall certify that the cables and accessories offered will be identical in all essentials design, material, and quality with the lines and accessories for which type approval certificates are provided in support of the Contract. The Supplier shall also ensure that all materials used will be subjected to and shall have satisfactorily withstand such tests as are necessary to manufacture the types of cable specified.

Cable splices shall not be permitted without the prior written authority of NPC.

#### **TS-5.4.2.2 Auxiliary Power and Control Cables**

##### Insulation

Auxiliary power and control cables shall, unless otherwise specified herein, be insulated for their entire length with a properly prepared, homogenous, heat and moisture-resistant grade of cross-linked polyethylene suitable for use at 90 ° C in wet and dry locations and armored with an overall PVC sheath. In addition, all control cable construction shall incorporate a general screening made of flexible copper tapes under the armor bedding.

##### Conductors

All conductors shall be stranded tinned annealed soft copper conductors. Solid conductors will not be accepted. Copper conductors shall meet the requirements of ASTM B3-74 or IEC 60228 C12.

##### Fillers

Cores shall be laid up to form a circular cable; where fillers are necessary to make a circular compact XLPE insulated cable, they shall be compatible with the conductor insulation and the jacket. Textile and other hygroscopic materials will not be accepted.

##### Screening

Control cables shall have an overall covering of flexible copper tape screening over the core assembly. This screening shall be helically applied around the cores, overlapped, and intercalated to provide full coverage and good flexibility. Braided metal will not be accepted.

##### Outer Jacket

The outer covering over the armor for all single and multi-core auxiliary power and control cables shall consist of a fire retardant, low acid gas emitting black extruded PVC sheath, which shall comply with the requirements of relevant standards.

##### Ground Conductor

All cables shall contain an un-insulated copper grounding conductor.

##### Low-Level Signal and Instrumentation Cables

Low-level Instrumentation and Signal Cables shall have tinned copper conductors insulated with polyethylene or PVC. Cables shall be 300 V class. Conductors shall be uniformly twisted in pairs. The multi-pair cables core assembly shall be filled, covered with separator tape, overall screened, aluminum interlocking armored over a PVC armor bedding, and sheathed with a neoprene jacket. A drain wire effectively bonded to the overall screen shall be incorporated into the cables and suitable for internal and external use in a sub-tropical climate.

#### Conductors

Each conductor shall consist of a solid wire of commercially pure annealed copper, smoothly drawn and free from all defects, uniformly coated with pure tin, and a standard diameter with a minimum cross-section of 0.8 mm<sup>2</sup>. The tinned wire shall be clean and meet the sulfate test requirements specified in the relevant standard.

#### Insulation and Standard Insulation Colours

The conductor insulation shall be either extruded polyethylene or extruded PVC.

Polyethylene and PVC insulation shall be of the type by relevant standards.

The colors for polyethylene insulated and PVC insulated conductors shall meet the requirements of relevant standards.

#### Over sheath

The outer protective covering shall consist of an overall neoprene jacket and colored grey.

The outer covering shall contain an evenly dispersed mixture of an environmentally approved anti-termite protective compound.

#### Cable Lengths

Cables shall be supplied in drum lengths of not less than 500 m unless shorter lengths are specified or are required to complete a specific order.

#### Joining and Termination Accessories

Straight-through joining accessories shall be designed to accommodate soldered ferrule conductor joints. Compression-type conductor joints will not be accepted.

Mechanical glands for the cable termination at the joining accessory shall meet the requirements of applicable standards. They shall be correctly designed for the termination of galvanized steel wire armor. The gland shall adequately secure the armor and provide electrical continuity between the armor and the body of the gland. It shall also provide a watertight seal between

the cable over the sheath and the cable inner sheath or bedding tapes and prevent moisture ingress.

### **TS-5.4.2.3 Cable Installation**

Cable runs shall be continuous from terminal to terminal to the extent permitted by available commercial lengths.

Insulated wire and cables shall be handled carefully to avoid kinking and damage to insulation and outer jackets. Lines shall not bend around a radius less than recommended by the manufacturer.

All lugs, terminals, spade or ring terminals, and terminal blocks required that are not furnished with the equipment shall be given, and all the connections needed to provide a complete installation ready to operate shall be made. Cable identification tags of a permanent type shall be provided and installed on all cables used for power, control, annunciation, instrumentation, communication, and lighting (except branch lighting conductors) to identify lines. Splices made in hand holes and boxes shall also be permanently and prominently tagged. Tags shall bear the cable or wire designations. Samples of the proposed labels shall be submitted for approval.

No cable shall be pulled into a duct unless the duct is clean and dry.

Cable wedges, basket-weave grips, and clamps shall be furnished and installed to support vertical or inclined cable runs.

High voltage cables shall be terminated with slip-on cable terminators suitable for the type of cable furnished. The cable terminators shall relieve dielectric stress using factory-formed components and conform to IEEE Standard 48, "Standard Test Procedures for High Voltage Alternating Current Cable Termination."

Metallic tapes of shielded cables shall be grounded at only one end of the wires.

Connections in lighting wires and cables shall be insulated with not less than two half-lapped layers of plastic insulating tape or high-grade rubber tape over which friction tape shall be applied. Splices shall be soldered. They shall be made mechanically and electrically perfect before solder is used.

Enough slack shall be allowed in each run to permit contraction and expansion. Where several single-conductor cables or wires comprising a circuit are trained through a pull box, terminal box, wiring gutter, or tray, they shall be neatly cabled and tied together. Cables shall be laced using an approved lacing cord, and the lacing method shall be subject to approval. Exposed wires and cables shall be cleaned of all wire-pulling lubricant that may have remained on the wires after pulling through conduits or ducts.

### **Supports, Racks, and Conduits**

Cables entering accessible standing equipment compartments from below shall be supported near the floor through approved cable clamps and brackets. Using electrical galvanized rigid steel conduit, fittings, and compatible hardware is not precluded. The Supplier shall submit his design, complete with component description for the above conditions, for approval of NPC.

Steel shall be galvanized steel for cable supports, racks, and fixing bolts, nuts, and screws. All steelwork supports shall be designed with a safety factor of not less than four.

Multi-core cables shall be clamped to the racks with smooth finish split packing pieces with bore diameters to suit the cable sizes. The packing pieces shall be of non-magnetic material. Single-core power cables shall be erected in separate non-magnetic clamps for approval of NPC. Wooden cleats will not be accepted.

For any cable trays to be provided outdoors, if applicable, covers of approved design and materials shall be included and erected as necessary to protect the cables against sun, weather, rain, mechanical damage, etc.

Where approved by NPC, fixing racks and associated hardware to the building's structural steelwork shall use bolted clamps. Weld gun stud fixing shall be allowed only if approved by NPC.

The Supplier shall submit the methods of fixing rack support and conduits to walls or ceiling for approval of NPC.

#### Erection in Racks

The Supplier shall ensure that cables are not subjected to undue pressure by cleats and clamps.

The spacing of racks in cable runs shall suit the type of cable to be erected and be by relevant standards.

#### **TS-5.4.2.4 Test**

Cables shall be tested at the factory by applicable standards to determine their compliance with the requirements of this specification. Tests shall be conducted on samples and the entire length of cables per the appropriate standards.

#### **TS-5.4.2.5 Data and Documentation Requirements**

The following documents shall be submitted after the award of the contract for NPC's review and approval before procurement and installation of the supplied equipment and materials:

- a) Outline drawings of UPS and accessories showing all critical dimensions and weights.
- b) Complete description of technical characteristics of each type of cable.
- c) Design (Type) Test Reports, if not submitted with the proposal;

- d) Cross-section and details of power, control, and instrumentation cables;
- e) Cable rating calculations;
- f) Make of each cable and cable reel;
- g) Installation procedure and splicing methods for high voltage cable;
- h) Description of High Voltage cable terminations and sealing ends;
- i) Description of cable supporting structures, cable tray, cable rack, cable fixing method, cable connection, cable spacer, cable clamps, bending radius, etc.;
- j) Power, control, and instrumentation cable routing plan;
- k) Cable schedule, including cable numbers, identification, sizes, etc.;
- l) List of drawings and schedule of submittal;
- m) Final Technical Data Sheets conforming to the specification;
- n) Detailed Contract Schedule Activity for the cables;
- o) Detailed QA Program based on ISO 9002;
- p) Routine Tests Reports;
- q) Field Tests to be performed and Field Test Reports.

#### **TS-6.0 ENVIRONMENTAL REQUIREMENTS AND OPERATING CONDITIONS**

All equipment shall conform to the environmental requirements and conditions applying to the location where it is to be used. Additional heating by equipment inside buildings must be considered.

All equipment and materials to be furnished shall meet this specification's performance and rating requirements, and all Supplier's guarantees shall be based on operation within the prevailing environmental conditions. This also applies during storage, and if susceptible to moisture absorption or fungus attack, the equipment and materials shall be treated with fungicidal varnish and otherwise be adequately tropicalized as far as necessary by national and international environmental and health and safety regulations.

Special measures shall be taken, such as using chemically treated insert parts and proper surface preparation and paint application per this Specification for equipment installed at Site(s) with a corrosive atmosphere to protect exposed metal parts and other materials susceptible to a chemical reaction.

Materials susceptible to deterioration from climatic conditions or subject to the formation of fungus or any other form of parasitic life shall preferably not be used. Still, these must be permanently protected if used and cannot be avoided.

For all outdoor equipment, the operation of the equipment must not be influenced by dew, fog, rain, wind, sun radiation, quick temperature changes, dust, smoke, salts, aggressive gases, and steam. Outdoor installations shall be protected against solar radiation using adequate covers, where required, with non-deteriorating material to be provided by the Supplier.

#### **TS-7.0 MISCELLANEOUS**

##### **TS-7.1 SUPPLIER'S SUPERVISION**

The Supplier shall provide a competent) Service Engineer or technician performs the complete tests, commissioning, and start-up of all equipment during installation.

The Supplier shall send only service engineers or technicians with adequate working knowledge of English.

NPC reserves the right, if services for a more extended period are needed, to ask for an extension of the Supplier's supervisors until such time that NPC's personnel have been thoroughly trained in the operation, test, and maintenance of the equipment supplied by the Supplier, at no cost to NPC.

The service engineer or technicians shall not be considered employees of the NPC for all legal intents and purposes. The Supplier shall be responsible for paying the service engineer or technician for all indemnities accruing of any labor accident that may occur during the work and for which the Supplier may be accountable under the Philippine Laws or any foreign laws.

#### **TS-7.2 TRAINING OF NPC PERSONNEL**

The Supplier shall provide local training courses for NPC's personnel in English.

Training shall be geared towards NPC's technical engineers and maintenance personnel by transferring technical knowledge.

Local training shall be conducted for five (5) NPC personnel for not more than one (1) month. The Supplier shall provide similar training documentation and local meals to NPC personnel. NPC shall provide a training room and any available test facilities.

Training selected from NPC maintenance staff will be qualified electrical and electronic personnel. Their experience will be broad and general technical, including general familiarity with electronic systems and testing facilities.

The training course cost shall be included in the Contract Price for the equipment.

##### Training Objectives

The training courses shall be designed to:

- a) Enable maintenance staff to perform maintenance of the equipment by teaching the principle of operation troubleshooting methods and procedures leading to the identification and replacement of faulty pieces of equipment, modules, units, and components, with the objective that NPC's personnel will become capable of carrying out repair and maintenance without outside assistance.

- b) Enable maintenance staff to perform routine equipment maintenance through electrical and mechanical adjustments, lubrication, and replacement of parts subject to wear or with a limited life.
- c) Provide an understanding of the software, a working knowledge of the database for additions, modifications, and deletions, and the practical use of diagnostic programs.

Course Content

The training course shall consist of formal courses, including classroom training, instruction and explanation during shop tests and Factory Acceptance Tests, and practical work sessions with the Manufacturer’s specialists during the implementation of requirements of the Contract. Training shall be on the same hardware and software supplied under the contract.

Course Documentation

The Supplier shall submit a daily schedule for the entire training period and a syllabus for each course with a listing of course documentation no later than thirty (30) days before the start of training.

Documentation shall be provided covering each course to a level of detail so that the text is self-explanatory and enough as future reference.

Before starting a course, each trainee shall receive at least one (1) set of documentation covering that course. The Supplier shall submit to NPC one (1) set of course documentation per trainee no later than fifteen (15) days before the start of each course.

**TS-8.0 INSPECTION, TESTING AND ACCEPTANCE CRITERIA**

**TS-8.1 TESTING**

**TS-8.1.1 General**

The Supplier shall perform at his own expense all tests required to ensure the adequacy of design, material, quality, and conformance of the equipment to be supplied to the guaranteed data and other requirements of the specifications and standards.

Certified test reports/results of all tests conducted shall be submitted to NPC for evaluation and acceptance.

**TS-8.1.2 Factory Acceptance Test**

**TS-8.1.2.1.1 Field Test**

Field tests and acceptance tests shall be performed by the Supplier and witnessed by an NPC representative to determine whether the specification





requirements have been fulfilled. The Supplier shall provide instructions and acceptance criteria for field testing for NPC's review and approval before conducting such tests and commissioning the equipment. No field tests shall be performed unless approved by NPC.

#### **TS-8.1.2.1.2 Test Reports**

One (1) electronic (CD format) and five (5) certified copies of the reports of all NPC's specified tests and other manufacturer standard tests shall be furnished to NPC immediately within a maximum of fifteen (15) days following the completion of the tests. For equipment with the required type test already, the type test certificates shall be submitted by the Supplier with his proposal.

For the routine tests, acceptance tests, and field tests, the test certificates shall include, in addition to the test results, the following information:

- a) Test certificate date
- b) Equipment data
- c) Client's reference number
- d) Equipment serial number

Certified test data submitted to NPC shall also include copies of oscillography records made with the tests.

The Supplier shall provide these records and reports.

#### **TS-8.1.2.2 Waiver of Factory Acceptance Test Witnessing/Inspection**

Where Factory Acceptance Tests (FAT) to be witnessed by NPC representative(s) have been required in the Technical Data Sheets of equipment, costs of these tests witnessing shall be deemed included in the price for the equipment.

If NPC opts not to witness the Factory Acceptance Tests, NPC will issue a Certificate of Waiver of Tests Witnessing/Inspection for the equipment and materials. In such case, the Supplier shall proceed with the Factory Tests by the requirement of the specification and the manufacturer's test specification as approved by the NPC.

Where Factory Tests are not required to be witnessed by NPC representative(s) as indicated in the Technical Data Sheets of the equipment, a Certificate of Waiver of Tests Witnessing/ Inspection will also be issued by NPC. In this case, no claim can be made by NPC on the Supplier due to waiving the Factory Acceptance Tests.

#### **TS-8.2 INSPECTION**

Upon the arrival of equipment/components and materials at the site, NPC and the Supplier or their authorized representatives shall jointly verify the delivered equipment/components and materials following the steps below:

- a. Inspection and verification of the packing list;
- b. Visual inspection of the condition of the packing and its surfaces; and
- c. Partial opening of the crates and plastic sheet protection to verify the content and its physical condition and to check for pilferage or damage during shipment and storage.

A record shall be prepared carefully noting all eventual shortages, defects, or damages, signed by the Supplier and concurred by NPC. The Supplier shall immediately replace all shortages and damages reported at his own cost. Supplier shall also ensure the timely delivery of such replacement without affecting the agreed-upon contract implementation schedule.

### **TS-8.3 ACCEPTANCE**

Acceptance certificate shall be issued only after all the required inspections and verifications are conducted and performed.

Suppose any of the equipment delivered failed to pass inspection and evaluation. In that case, NPC may, at his judgment, direct the Supplier to replace equipment/spare parts as deemed appropriate.

### **TS-9.0 DOCUMENTS AND DRAWINGS TO BE SUBMITTED**

- a. To be submitted with the bid:
  - a.1 Completely filled out in Sections 1.0 and 2.0 of the Technical Data Sheets (TDS);
  - a.2 Original Copy of the Manufacturer/Distributor Authorization to Bid, directly addressed to the BAC-NPC, indicating therein the PR/Reference number for the following equipment;
    - Distributed Control System (DCS)
    - Generator Protection Relay
    - Transformer Protection Relay

In case of an authorized Distributor issuing the authority to bid, it shall be accompanied by a Certificate of Authorized Distributorship from the Manufacturer.

*Note: Authorization to bid and Certificate of Distributorship from the Manufacturer shall be current and valid for at least Six (6) months from the date of bid opening as advertised.*

- a.3 Work Plan
- b. To be submitted during post-qualification:
  - b. Completely filled out Sections 3.0 to 6.0 of the Technical Data Sheets (TDS);

- b.2 Letter of Confirmation from the Manufacturer that a local agent or representative is available to provide "After Sales Service" to the supplied components/parts/accessories during and after the warranty period. Name, address, and contact number shall be provided;
  - b.3 Manufacturer's Brochures/Catalogues/Drawings which contain information/data to support the Supplier's submitted and filled-out Technical Data Sheet;
  - b.4 Certificate of Site Inspection duly signed by NPC's authorized plant personnel; and
  - b.5 Certificate from their customer (end-user) duly addressed to the Bidder that the supplied equipment is/are like the items subject for bidding and has performed satisfactorily in service. The certification must be indicated in the PR/Reference Number and date of issuance.
- c. To be submitted before or upon delivery:
- c.1 "Certificate of Origin" from the Manufacturer.
  - c.2 "Warranty Certificate" for one (1) year against factory defects/quality.
  - c.3 Quality Assurance or Quality Inspection Certificate from the Manufacturer.
  - c.4 User Manual in Three (3) copies.
  - c.5 Brochure, Catalogue & Technical Specification.
  - c.6 As-built drawings as finally approved.
  - c.7 Type Tests Certificate with Test Reports in Five (5) copies.
  - c.8 Routine and Quality Conformance Certificate with Test Reports in Five (5) copies.
  - c.9 Certified Test and Inspection Reports duly signed and witnessed by NPC representative; and
  - c.10 Certificate to show that the item to be delivered is brand new.

NOTE: All documents and drawings in Clause TS-5.0 and TS-9.0 shall be submitted to the Plant Manager – **Manager, Agus 2 HEP**, for evaluation and approval before issuance of the Acceptance Certificate.

#### **TS-10.0 GUARANTEE**

The Supplier shall guarantee to complete the repair of equipment/device /materials and replacement within sixty (60) calendar days, upon notice, of the

supplied equipment/device/material at his own expense against defect in design, artistry, and materials for one (1) year after issuance of Acceptance Certificate by NPC. The Supplier shall guarantee that the unit will perform in the manner as outlined in the equipment's manual and the Contract.

The Supplier shall submit a Warranty Certificate (at least one year) effective from the date of acceptance by NPC.

After the lapse of the warranty period, NPC shall release the warranty security/certificate if no defects are found.

#### **TS-11.0 MEASUREMENT OF PAYMENT**

Payment will be made at the contract lot price of the item(s) delivered in the Bid Price Schedule. Payment thereof shall constitute the total compensation for the supply, delivery, installation, test, and commissioning of the

SECTION VI

PART II

**TECHNICAL DATA  
SHEETS**

## SECTION VI – TECHNICAL SPECIFICATIONS

### PART II – TECHNICAL DATA SHEETS

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**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



**SECTION VI – TECHNICAL SPECIFICATIONS**

**PART II – TECHNICAL DATA SHEETS**

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6.0	POWER CONTROL AND INSTRUMENTATION CABLE	VI-TDS-29

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



**SECTION VI – TECHNICAL SPECIFICATIONS**

**PART II – TECHNICAL DATASHEETS**

**SECTION 1.0 – 2.0**

**Documents to be Submitted during the Bid Opening**

1. The following Technical Data Sheets shall be filled-out and submitted with the Bid Proposal.
2. The Bidder is required to provide all the necessary information under the Column "Supplier's Data." Although not given by NPC, the Supplier's Data shall be based on the International Standard.
3. NPC's requirements are indicated below. The Supplier shall show their data corresponding to the said NPC requirements to facilitate evaluation of the Supplier's compliance with the specifications.
4. Deviation from the requirements in the Technical Data Sheets shall be grounds for disqualification.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_





## SECTION VI – TECHNICAL SPECIFICATIONS

### PART II – TECHNICAL DATA SHEETS

**1.0 DISTRIBUTED CONTROL SYSTEM<sup>1</sup>**

**1.1 System Capacity Description**

Description	NPC Requirements	Supplier's Data
a. Manufacturer	By Supplier	_____
b. Place of Manufacturer	By Supplier	_____
c. No. of Operating Console (Operator Workstation)	2 Sets	_____
d. No. Of event and record printer (Dot Matrix)	1 Unit	_____
e. No. of Maintenance and Configuration Console (Engineering Workstation)	1 Set	_____
f. No. of subsystems devoted to substation unit management	As Required	_____
g. Total no. of turbine-generator equipment and associated auxiliary devices managed by DCS.	Refer to System Architecture	_____

<sup>1</sup>Data given are minimum requirements. Supplier may offer DCS System with greater system capability.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
h. No. of binary inputs per single subsystem devoted to unit management	As Required With 30% spares	
i. No. of equipment display	In accordance with the number of different equipment in power station	
j. System Architecture designed to allow modification/configuration of hardware (i.e., additional unit computers and software) <sup>2</sup>	Yes	
k. System software, including maintenance and configuration editor software	To be Provided	

**1.2 Technical Features and Characteristics of Centralized Control Unit (CCU)**

a. Manufacturer	By Supplier	
b. Place of Manufacturer	By Supplier	
c. Description/Type	Modular Industrial Computer	
d. Modularity	CPU + I/O Module	

<sup>2</sup>Modification will not require any changes in the existing hardware and services of the Supplier in case of future expansion

**Name of Bidder :** \_\_\_\_\_

**Signature of Bidder :** \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
e. Hardware	Latest available model on time of award	
f. Communication Interface		
1. Local Area Network	Refer to System Architecture	
2. Communication Protocols	MODBUS, TCP/IP, IEC60870, IEC 61850, IEEE 802.3, CSMA/CD, Ethernet/IP, DNP 3, etc.	
<b>1.3 Technical Features and Characteristics of Human Interface Station (HIS)</b>		
a. Manufacturer	By Supplier	
b. Place of Manufacturer	By Supplier	
c. Description/Type	Multi-task Industrial Computer, Workstation and Desktop	
d. Hardware	Latest available model on time of award	
<b>1.4 Technical Features and Characteristics of Engineering Workstation (EWS)</b>		
a. Manufacturer	By Supplier	

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
b. Place of Manufacturer	By Supplier	
c. Description/Type	Multi-task Industrial Computer, Workstation or Desktop	
d. Hardware	Latest available model on time of award	
<b>1.5 Technical Features and Characteristics of Sequence of Event (SOE) Manager</b>		
a. Manufacturer	By Supplier	
b. Place of Manufacturer	By Supplier	
c. Description/Type	Multi-task Industrial Computer, Workstation or Desktop	
d. Hardware	Latest available model on time of award	
<b>1.6 Technical Features of Printer and otherPeripheral Equipment<sup>3</sup></b>		
a. Manufacturer	By Supplier	
b. Place of Manufacturer	By Supplier	
c. Event recorder printer	Dot matrix	

<sup>3</sup> The Supplier to provide instruction manuals.

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



**1.7 Technical Features and Characteristics of Time Synchronization Unit**

Description	NPC Requirements	Supplier's Data
a. Manufacturer	By Supplier	
b. Place of Manufacturer	By Supplier	
c. General Features		
1. Type	Modular System	
2. Description	Industrial Master Clock with SNTP time protocol per IEC 61850 standard	
d. Synchronization		
1. Internal Synchronization	GPS, synchronization TOP, Time code on a serial link, and all-time code format necessary within the power station	
2. External Synchronization	GPS, capability for time code on serial link one-time code	

**Name of Bidder :** \_\_\_\_\_

**Signature of Bidder :** \_\_\_\_\_



**2.0 PROTECTION RELAY SYSTEM**

**2.1 GENERATOR PROTECTION RELAY**

**2.1.1 Generator Protection Relay Technical Features & Characteristics**

Description	NPC Requirements	Supplier's Data
a. Manufacturer	_____	_____
b. Place of Manufacturer	_____	_____
c. Construction	Microprocessor-based or numerical	_____
d. Mounting	To be installed inside the panel enclosure	_____
e. Configuration editor and maintenance software for protection relays to be provided	Yes	_____
f. Operating frequency	60 Hz	_____
g. Relays and functions:		
1. Generator-Differential (87)	To be included	_____
2. Lock-out (86)	To be included	_____
3. Frequency (81O/81U)	To be included	_____
4. Over voltage (59)	To be included	_____
5. Under voltage (27)	To be included	_____
6. Voltage balance relay (60)	To be included	_____
7. Stator thermal overload (49)	To be included	_____
8. AC Time overcurrent (51)	To be included	_____
9. Instantaneous overcurrent (50)	To be included	_____
10. Negative phase sequence (46)	To be included	_____
11. Loss of excitation (40)	_____	_____

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
12. Directional power (32)	To be included	_____
13. Volts/hertz (24)	To be included	_____

**2.2 TRANSFORMER PROTECTION RELAY**

**2.2.1 Transformer Protection Relay Technical Features & Characteristics**

a. Manufacturer	_____	_____
b. Place of Manufacturer	_____	_____
c. Construction	Microprocessor-based or numerical <sup>4</sup>	_____
d. Mounting	To be installed inside the panel enclosure	_____
e. If individual relays are to be supplied, the required no. of protection sets for a single transformer (specify one, two, etc.)	One <sup>5</sup>	_____
f. Configuration editor and maintenance software for protection relays to be provided	Yes	_____
g. Operating frequency	60 Hz	_____
h. Provided with the following relays and functions:		
1. Generator-Transformer-Differential (87GT)	To be included	_____

<sup>4</sup> If a numerical protection is proposed, it shall have an integrated overcurrent (if required), overload and over fluxing (if required) relays as backup for the differential protection function.

<sup>5</sup> The technical data stated are taken from the requirements of both ANSI/IEEE C.37.91 and IEC 255. The Supplier shall fill-up the applicable data requirements stated for the relay to be supplied.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
2. Generator-Transformer Lock-out (86GT)	To be included	
3. Over voltage (59)	To be included	
4. Over-fluxing (59F)	To be included	
5. Restricted earth fault	To be included	
6. Overcurrent (50/51) <sup>6</sup>	To be included	
7. Neutral overcurrent (51N) <sup>7</sup>	To be included	
8. Restraint percentage	20 %	
9. Current taps for winding (for CT ratio matching)	With vector group and CT ratio compensation	

<sup>6</sup>The Supplier to indicate the proposed measuring range i.e. instantaneous and time delay.

<sup>7</sup>The Supplier to give full description i.e. methods of stabilizing for inrush current.

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_





**SECTION VI – TECHNICAL SPECIFICATIONS**

**PART II – TECHNICAL DATASHEETS**

**SECTION 3.0 – 6.0**

**Documents to be Submitted during the Post Qualification as Reference for the Approval of Manufacturer’s Brochures/Drawings**

1. The following shall be filled out and to be submitted during the post qualification.
2. Filled-out data by the Supplier shall only be a reference for reviewing and approving brochures/drawings during the implementation stage.
3. The Bidder is required to provide all the necessary information under the Column “Supplier’s Data.” Although not given by NPC, the Supplier’s Data shall be based on the International Standard.
4. NPC’s requirements are indicated below. The Supplier shall show their data corresponding to the said NPC requirements to facilitate evaluation of the Supplier’s compliance to the specifications.
5. Deviation from the requirements in the Technical Data Sheets shall be grounds for disqualification.
6. Non-submission of the documents shall be grounds for disqualification.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



**SECTION VI – TECHNICAL SPECIFICATIONS**

**PART II – TECHNICAL DATASHEETS**

**3.0 DISTRIBUTED CONTROL SYSTEM<sup>8</sup>**

**3.1 System Capacity Description**

Description	NPC Requirements	Supplier's Data
a. Manufacturer	By Supplier	_____
b. Place of Manufacturer	By Supplier	_____
c. No. of Operating Console (Operator Workstation)	2 Sets	_____
d. No. of event and record printer (Dot Matrix)	1 Unit	_____
e. No. of maintenance and configuration console (Engineering Workstation)	1 Set	_____
f. No. of subsystems devoted to substation unit management	As Required	_____
g. Total no. of turbine-generator equipment and associated auxiliary devices managed by DCS.	Refer to System Architecture	_____
h. No. of binary inputs per single subsystem devoted to unit management	As Required with 30% spares	_____

<b>Description</b>	<b>NPC</b>	<b>Supplier's</b>
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<sup>8</sup>Data given are minimum requirements. The Supplier may offer DCS with greater system capability.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



	<b>Requirements</b>	<b>Data</b>
i. No. of equipment display	By the number of different equipment in the power station	_____
j. System Architecture designed to allow modification/configuration of hardware (i.e. additional unit computers and software) <sup>9</sup>	Yes	_____
k. System software, including maintenance and configuration editor software	To be Provided	_____
<b>3.2 Technical Features and Characteristics of Centralized Control Unit (CCU)</b>		
a. Manufacturer	By Supplier	_____
b. Place of Manufacturer	By Supplier	_____
c. Description/Type	Modular Industrial Computer	_____
d. Modularity	CPU + I/O Module	_____
e. Hardware		
1. Processor	Latest available model on time of award	_____
2. Clock frequency	Latest available model on time of award	_____
3. RAM for programs	As Required	_____
4. RAM capacity for data	As Required	_____
5. REFROM capacity	As Required	_____

Description	NPC	Supplier's

<sup>9</sup> Modifications will not require any changes in the existing hardware and services of the Supplier/ Manufacturer in case of future expansion.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



	<b>Requirements</b>	<b>Data</b>
6. Key Features	High-performance, High-reliability modular controller	_____
7. RAS Features	CPU self-diagnostics, I/O diagnostics	_____
8. Module Configuration	Duplex, Hot-Swappable	_____
9. Heat Dissipation	Low heat dissipation eliminates the need for a fan	_____
10. Protection	Manufacturer's Std.	_____
11. Power Supply Input <sup>10</sup>	220 to 240VAC	_____
12. Communication Method	Full/Half Duplex(Software Setting)	_____
13. Network Interface	RS-232C (Serial)and/or RJ45 (TCP-IP)	_____
14. Communication Protocol	DNP 3.0 and/or DNP3.0, TCP-IP and/or IEC61850, etc.	_____
f. Software		
1. Key Specifications	Multiple Process Intensive Control, Wide Area Communication	_____
2. Sequential Control	Relatively High (Logic)	_____
3. Cyber Security	By Supplier	_____

Description	NPC	Supplier's
_____		

<sup>10</sup>The Supplier shall design his equipment based on the hardware's power supply characteristics.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



g. Binary inputs

1. Capacity		System requirements with 30% spare inputs	_____
2. Modularity <sup>11</sup>		By Supplier	_____
3. Rated Voltage	Working	By Supplier	_____
4. Discrepancy Management		Yes	_____
5. High flow event acquisition capability		Yes	_____

h. Low level analog inputs

1. Capacity		System requirements with 30% spare inputs	_____
2. Modularity <sup>11</sup>		By Supplier	_____

i. High level analog inputs

1. Capacity		System requirements with 30% spare inputs	_____
2. Measurement Method		Rapid Sampling and Digital Computation	_____

j. Binary Outputs

1. Capacity		System requirements with 30% spare inputs	_____
2. Modularity <sup>11</sup>		By Supplier	_____
3. Protection		Manufacturer's Std.	_____

**Description**

**NPC Requirements**

**Supplier's Data**

<sup>11</sup> The Supplier may offer other modularity

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



	Requirements	Data
k. Communication Interface		
1. Local Area Network	Refer to System Architecture	
2. Communication Protocols	MODBUS, TCP/IP, IEC60870, IEC 61850, IEEE 802.3, CSMA/CD, EtherNet/IP, DNP 3, etc.	
<b>3.3 Technical Features and Characteristics of Human Interface Station (HIS)/ Engineering Workstation (EWS)/ Sequence of Event (SOE) Manager</b>		
a. Manufacturer	By Supplier	
b. Place of Manufacturer	By Supplier	
c. Description/Type	Multi-task Industrial Computer, Workstation and/or Desktop	
d. Hardware		
1. CPU Processor	Latest available model on time of award	
2. Clock Frequency	At least 2.6 GHz	
3. RAM capacity	At least 8 GB	
4. Hard Disk Capacity	At least 1 TB	
5. Video RAM	At least 2 GB	
6. Monitor		
i. Size	32" LED Color Monitor	
ii. Resolution	1280 x 1024	
iii. Graphical Capability Description	True Color 32-bit NPC	Supplier's

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



	Requirements	Data
<b>e. Software</b>		
1. Operating System	Windows or Equivalent	
2. Database Management	Specialized Relational Database Management Software	
3. Window System	Yes	
4. Communication Stack	OSI-TCP/IP	
<b>f. Peripheral</b>		
1. Communication Interface	TCP/IP SCSI Interface, IEEE 802.3 Interface, RS232 Interface, etc.	
2. Optical Drive	DVD + RW (Latest Speed)	
3. USB Drive Slot	Included	
4. Portable Mouse	Optical sensor type with scroll wheel	
<b>g. Power Supply (with UPS)</b>		
1. Voltage	220VAC, 1-Ø, 60Hz	
2. Redundancy	Yes	
3. Modular	Yes	
4. Hot-Swappable	Yes	

**3.4 Technical Features of Printers and other Peripheral Equipment<sup>12</sup>**

a. Manufacturer	By Supplier	
b. Place of Manufacturer Description	By Supplier NPC	Supplier's

<sup>12</sup> The Supplier to provide instruction manuals

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_



	Requirements	Data
c. Event recorder printer		
1. Type	Inkjet	
2. Engine feature	Not less than 20ppm print engine	
3. Resolution <sup>13</sup>	Not less than 600 dpi	
4. Paper Size	Up to A3	
<b>3.5 Technical Features and Characteristics of Time Synchronization Unit</b>		
a. Manufacturer	By Supplier	
b. Place of Manufacturer	By Supplier	
c. General Features		
1. Type	The built-in function of the Generator Protection Relay	
2. Description	Industrial Master Clock with SNTP time protocol per IEC 61850 standard	
d. Synchronization		
1. Internal Synchronization	GPS, synchronization TOP, Time code on the serial link, all time code format necessary within the power station	
2. External Synchronization	GPS, capability for time code on serial link one-time code	

**3.6 TRAINING REQUIREMENTS**

<sup>13</sup> The Supplier may offer better printer resolution than what is specified.

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_





Description	NPC Requirements	Supplier's Data
a. Manufacturer-supervised Hands-on Technical Training, including configuration, setting, and parameterization at the Manufacturer's Laboratory facilities (Yes, No)	No	
b. Required number of personnel to attend Hands-on Technical Training	N/A	
c. Operating and Configuration Editor Software Program		
1. All system software and configuration editor software programs, including licenses shall be supplied and included in the cost of the DCS System	Yes	
2. A set of each type of software, including licenses plus instruction manuals, shall be furnished.	Yes	
3. The DCS System shall be configured considering the future expansion as shown on the system architecture	Yes	
d. The training requirements for the DCS System shall be as specified in the Technical Requirements.	Local Training	

**3.7 TEST AND EXPERIENCE REQUIREMENTS**

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
<b>a. Test Requirements</b>		
1. Design Test and Certified Test Reports of the DCS components required (Yes, No) *	Yes	
2. Certified test design reports of prototype or duplicate production type are acceptable (Yes, No) *	Yes	
3. Test frequency requirements	60 Hz	
4. Factory Acceptance (Routine) Tests to be performed on the DCS (Yes, No)	No	
5. Factory Acceptance (Routine) Tests to be witnessed by NPC representative (Yes, No)	No	
<b>b. Equipment and Manufacturer's Experience</b>		
1. The manufacturer should have been in the business of manufacturing the type of equipment for not less than: **	10 Years	
2. The same type of DCS system architecture for the power station being offered should have been in the actual service for not less	5 Years	

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



than: \*\*

**4.0 PROTECTION RELAY SYSTEM**

**4.1 GENERATOR PROTECTION RELAY**

**4.1.1 Cubicle Details of Generator Protective Relay**

Description	NPC Requirements	Supplier's Data
a. Cubicle type	Enclosed swinging rack	
b. Panel type (specify mosaic, sheet steel)	Sheet steel	
c. With gasketed doors (Yes, No)	Yes	
d. Degree and protective class applied	Yes, IP50	
e. Cable entrance	Bottom	
f. Access for maintenance and testing (specify front, rear, front & rear)	Front	

**4.1.2 Generator Protection Relay Technical Features & Characteristics**

a. Construction	Microprocessor-based and/or numerical	
b. Mounting	To be installed inside the panel enclosure	
c. Configuration editor and maintenance software for protection relays to be provided	Yes	
d. Operating frequency	60 Hz	
e. Relays and functions:		
1. Generator-Differential (87)	To be included	

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
2. Lock-out (86)	To be included	
3. Frequency (81O/81U)	To be included	
4. Over voltage (59)	To be included	
5. Under voltage (27)	To be included	
6. Voltage balance relay (60)	To be included	
7. Stator thermal overload (49)	To be included	
8. AC Time overcurrent (51)	To be included	
9. Instantaneous overcurrent (50)	To be included	
10. Negative phase sequence (46)	To be included	
11. Loss of excitation (40)	To be included	
12. Directional power (32)	To be included	
13. Volts/hertz (24)	To be included	

**4.2 TRANSFORMER PROTECTION RELAY**

**4.2.1 Cubicle Details of Transformer Protection Relay**

a. Cubicle type	Enclosed swinging rack	
b. Panel type (specify mosaic, sheet steel)	Sheet steel	
c. With gasketed doors (Yes, No)	Yes	

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
d. Degree and protective class applied	Yes, IP50	
e. Cable entrance	Bottom	
f. Access for maintenance and testing (specify front, rear, front & rear)	Front	

**4.2.2 Transformer Protection Relay Technical Features & Characteristics**

a. Construction	Microprocessor-based or numerical <sup>14</sup>	
b. Mounting	To be installed inside the panel enclosure	
c. If individual relays are to be supplied, the required no. of protection sets for a single transformer (specify one, two, etc.)	One <sup>15</sup>	
d. Configuration editor and maintenance software for protection relays to be provided	Yes	
e. Operating frequency	60 Hz	

<sup>14</sup> If numerical protection system is proposed, it shall have an integrated overcurrent (if required), overload and over fluxing (if required) relays as backup for the differential protection function.

<sup>15</sup> The technical data stated are taken from the requirements of ANSI/IEEE C.37.91 and IEC 255. The Supplier shall fill-up the applicable data requirements stated above for the relay to be supplied.

**Name of Bidder** : \_\_\_\_\_

**Signature of Bidder** : \_\_\_\_\_

Description	NPC Requirements	Supplier's Data
f. Provided with the following relays and functions:		
1. Generator-Transformer-Differential (87GT)	To be included	
2. Generator-Transformer Lock-out (86GT)	To be included	
3. Over voltage (59)	To be included	
4. Over-fluxing (59F)	To be included	
5. Restricted earth fault	To be included	
6. Overcurrent (50/51) <sup>16</sup>	To be included	
7. Neutral overcurrent (51N) <sup>17</sup>	To be included	
8. Restraint percentage	20 %	
9. Current taps for winding (for CT ratio matching)	With vector group and CT ratio compensation	

**4.3 TEST AND EXPERIENCE REQUIREMENTS**

**4.3.1 Test Requirements**

1. Design Test and Certified Test Reports for each of the relay components (Yes, No) *	Yes	
--	-----	--

<sup>16</sup> The Supplier to indicate the proposed measuring range i.e. instantaneous and time delay.

<sup>17</sup> The Supplier to give full description i.e. methods of stabilizing for inrush currents.

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
2. Certified test design reports of prototype or duplicate production type are acceptable (Yes, No) *	Yes	
3. Additional tests are required; if yes, see Item 4.3.2	Yes	
4. Test frequency requirements	60 Hz	
5. Test reports of Supplier instead of manufacturer (acceptable, not acceptable):	Not acceptable	
6. Factory Acceptance (Routine) Tests to be witnessed by NPC representative (Yes, No)	No	

**4.3.2 Additional Test**

1. If additional tests are required, they shall be the Manufacturer's test standards, not within the specified test of either ANSI or IEC standards.

Included

**4.3.3 Equipment and Manufacturer's Experience**

1. The manufacturer should have been in the business of manufacturing the type of equipment for not less than: \*\*

5 Years

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
2. The same type of equipment being offered should have been in the actual service for not less than: **	2 Years	
<b>5.0 UNINTERRUPTIBLE POWER SUPPLY (UPS)</b>		
<b>5.1 BATTERY CHARGER/RECTIFIER</b>		
a. Manufacturer	By Supplier	
b. Place of manufacturer	By Supplier	
c. Construction	Microprocessor-based controlled	
d. Degree of protective class applied	IP52	
e. Cable entrance (specify top, bottom)	Bottom	
f. Access for maintenance (specify front, rear, front & rear)	Front & rear	
g. Output power continuous rating	3 kVA	
h. Input voltage:		
1. Main 1 source	240VAC	
2. Main 2 source (bypass source)	125 VDC	
i. DC input characteristics:		
1. Input voltage	125 VDC, +10% to -15%	
2. Maximum input voltage	140 VDC	

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_





Description	NPC Requirements	Supplier's Data
3. Provision for transient voltage surge suppression to be provided (yes, no)	Yes	
j. AC input characteristics:		
1. Input frequency	60 Hz, -25% to +15%	
2. Maximum input current at low line voltage (A)	Manufacturer's data	
3. Input power factor	≥ 0.85 lagging	
4. Harmonics distortion of input current waveform	Less than 2.5% at full load	
5. Magnetizing inrush current	Less than nominal input current for less than one cycle	
6. Input surge protection	Equipped with input MOV's to withstand surges	
k. AC output characteristics:		
1. Voltage regulation	±1% for balanced load, ±2.5% for 100% unbalanced load	
2. Frequency	60±0.1% when free running	
3. Voltage distortion	2% (max.) total THD and 1% any single harmonics on 100% linear loads	

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
4. Voltage transient (step load) response	+3% for 50% step load change ±5% for 100% step load change ±1% for loss of return of AC input power or manual transfer full load	
5. Voltage recovery time	Within 1% of the nominal value within 1-cycle	
6. Phase angle displacement	120° ±1° for balanced load 120° ±3° for 100% unbalanced load	
7. Inverter overload capability	120% at rated full load for 1 minute 145% of rated full load for 30 sec.	
I. DC Bus:		
1. DC Bus Voltage		
a. Nominal	125 Vdc	
b. Minimum	106.25 Vdc	
c. Maximum maintenance charge voltage	140 Vdc	
d. Equalization voltage	By Supplier <sup>18</sup>	
2. Maximum DC current	By Supplier <sup>18</sup>	

<sup>18</sup> The Supplier to fill-up the required data.

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



	Description	NPC Requirements	Supplier's Data
m. Other Features:			
1. To form part of a Distributed Control System (DCS)	Yes		
2. Remote indication for alarm to be provided at the DCS	Yes		
3. RS-232-C/485 communication port to be provided	Yes <sup>19</sup>		
4. Provided with contacts for a sequence of events recorder	Yes, all possible indicators		

**5.2 TEST AND EXPERIENCE REQUIREMENTS**

**5.2.1 Test Requirements**

1. Design (type) and Routine test and certified test reports of UPS system components required (yes, no) *	Yes	
2. Test frequency requirements	60 Hz	

**5.2.2 Equipment and Manufacturer's Experience**

1. The manufacturer should have been in the business of manufacturing the type of equipment for not less than: **	10 Years	
---	----------	--

<sup>19</sup> The Supplier to give full description of all possible indicators and alarms.

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



Description	NPC Requirements	Supplier's Data
2. The manufacturer should have a supply record of UPS with the same capacity or greater of not less than: **	10 Units	
<b>6.0 POWER, CONTROL, and INSTRUMENTATION CABLE</b>		
<b>6.1 600V POWER CABLE<sup>20</sup></b>		
<b>6.1.1 Cable Design Data</b>		
a. No. of conductors/cable and size	By Supplier <sup>21</sup>	
b. Conductor Material	Annealed copper stranded wire for all conductors	
c. Conductor Shape	Circular stranded for all cables	
d. Type of insulation	PVC for all cables	
e. Thickness of insulation of conductors not less than	Manufacturer's std.	
f. Type of jacket	PVC Jacketed for all cables	
g. Thickness of jacket/outer sheath not less than	1.8 for all cables	
h. Provided with filler and binder tape	Yes, for all cable	
i. Maximum outside diameter	Manufacturer's std.	

<sup>20</sup> The Cable to be provided shall be capable to withstand insulation test voltage of at least 2000V.

<sup>21</sup> The Supplier to give full description of various number of conductor/cable and sizes.

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



j. Maximum Operating Temperature 90 °C

**6.2 600V CONTROL & INSTRUMENTATION CABLE**

**6.2.1 Cable Design Data**

Description	NPC Requirements	Supplier's Data
a. No. of conductors/cable and size	By Supplier <sup>21</sup>	
b. Conductor Material	Annealed copper stranded wire for all conductors	
c. Conductor Shape	Circular stranded for all cables	
d. Type of insulation	PVC for all cables	
e. Thickness of insulation of conductors not less than	Manufacturer's std.	
f. Type of jacket	PVC Jacketed for all cables	
g. Thickness of jacket/outer sheath not less than	1.8 for all cables	
h. Provided with filler and binder tape	Yes, for all cable	
i. Overall shield required (yes, no)	Yes	
j. Type of shielding	Annealed copper tape with a minimum thickness of 0.05mm was applied helically over the binder tape	
k. Maximum outside diameter	Manufacturer's std.	
l. Maximum Operating Temperature	90°C	

**Name of Bidder :** \_\_\_\_\_

**Signature of Bidder :** \_\_\_\_\_



**6.3 TEST AND EXPERIENCE REQUIREMENTS**

**6.3.1 Test Requirements**

Description	NPC Requirements	Supplier's Data
1. Design test in accordance with applicable standards and reports required (Yes, No) *	Yes	
2. Certified Design Test Reports of previous tests conducted for same cables are acceptable: (Yes, No)	Yes	
3. Test frequency requirements	60 Hz	
4. Routine test to be performed	Yes	

**6.3.2 Equipment and Manufacturer's Experience**

1. The manufacturer should have been in the business of manufacturing power and control cables for not less than: **	10	
--	----	--

Name of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



## SECTION VII

# SCHEDULE OF REQUIREMENTS

SECTION VII - SCHEDULE OF REQUIREMENTS

**SECTION VII - SCHEDULE OF REQUIREMENTS**  
**UPGRADING OF ANNUNCIATOR, CONTROL AND PROTECTION**  
**SYSTEM OF UNIT NO. 3 AT AGUS 2 HEP PLANT**  
**PRE - PR**

ITEM NO.	DESCRIPTION	QTY.- UNIT	* C O D E	UNIT PRICE FOR GOODS AND RELATED SERVICES TO BE SUPPLIED AND DELIVERED					TOTAL PRICE
				Unit Price of Goods Delivered up to Philippine Port +(Phil. Peso)	Import Duties & other Levies Imposed by Phil. Govt. (Phil. Peso)	Value Added Tax and other Taxes Imposed by Phil. Govt. (Phil. Peso)	Local Transport from Port to Delivery Site <(Phil. Peso)	Labor (Installation, Testing and Commissioning) >(Phil. Peso)	Local Currency (Phil. Peso) ((E+F+G+H+I) x C)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1.0	Upgrading of Annunciator, Control and Protection System of Unit no. 3 at Agus 2 HEP Plant including all other works and services as specified in the Technical Specifications.	1 Lot							
	----- Nothing Follows -----								

- \* Bidders shall enter a code representing the Country of Origin of all imported Equipment, Materials and Accessories
- + Cost of equipment, freight, insurance, etc. up to Phil. port of entry
- < Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from the Phil port of entry to final delivery site
- > Unit Price for Local Transportation, insurance and other local costs incidental to delivery of the goods from local source to final delivery site

Note: Final delivery site of the equipment shall be at:  
**Agus 2 HEP Plant, Saguiaran, Lanao del Norte**

Name of Bidder: _____
Signature of Bidder: _____

Code	Country of Origin	





SECTION VIII

**BIDDING FORMS**



SECTION I

**INVITATION TO BID**

## SECTION VIII – BIDDING FORMS

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Sample Form	- Certification from DTI as Domestic Bidder

Standard Form No: NPCSF-GOODS-01

**Checklist of Technical & Financial Envelope Requirements for Bidders**

**A. THE 1<sup>ST</sup> ENVELOPE (TECHNICAL COMPONENT) SHALL CONTAIN THE FOLLOWING:**

**1. ELIGIBILITY DOCUMENTS**

**a. (CLASS A)**

- PhilGEPs Certificate of Registration and Membership under Platinum Category (all pages) in accordance with Section 8.5.2 of the Revised IRR of RA. 9184;

**Note:** The failure by the prospective bidder to update its Certificate with the current and updated Class "A" eligibility documents shall result in the automatic suspension of the validity of its Certificate until such time that all of the expired Class "A" eligibility documents has been updated

- Statement of all its ongoing government and private contracts if any, whether similar or not similar in nature and complexity to the contract to be bid (*NPCSF-GOODS-02*)
- The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, and whose value, adjusted to current prices using the Philippine Statistics Authority (PSA) consumer price index, must be at least 50% of the ABC (*NPCSF-GOODS-03*) complete with the following supporting documents:

1. Certificate of Acceptance; or Certificate of Completion; or Official Receipt (O.R); or Sales Invoice

*(The Single Largest Completed Contract (SLCC) as declared by the bidder shall be verified and validated to ascertain such completed contract. Hence, bidders must ensure access to sites of such projects/equipment to NPC representatives for verification and validation purposes during post-qualification process.*

*It shall be a ground for disqualification, if verification and validation cannot be conducted for reasons attributable to the Bidder.)*

- Duly signed computation of its Net Financial Contracting Capacity (NFCC) at least equal to the ABC (*NPCSF-GOODS-04*) or a Committed Line of Credit (CLC) at least equal to ten percent (10%) of the ABC, issued by a Universal or Commercial Bank; if the Bidder opted to submit a Committed Line of Credit (CLC), the bidder must submit a granted credit line valid/effective at the date of bidding.

**b. (CLASS B)**

- For Joint Venture (if applicable), any of the following:

- Valid Joint Venture Agreement (*NPCSF-GOODS-05*)

**OR**

- Notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA, if awarded the contract

- Certification from the relevant government office of their country stating that Filipinos are allowed to participate in their government procurement activities for the same item/product (*For foreign bidders claiming eligibility by reason of their country's extension of reciprocal rights to Filipinos*)

Standard Form No: NPCSF-GOODS-01

## 2. Technical Documents

- Bid Security, any one of the following:
  - Bid Securing Declaration (NPCSF-GOODS-06c)  
**OR**
  - Cash or Cashier's/Manager's check issued by a Universal or Commercial Bank – 2% of ABC;  
**OR**
  - Bank draft/guarantee or irrevocable letter of credit issued by a Universal or Commercial Bank: (NPCSF-GOODS-06a) - 2% of ABC;  
**OR**
  - Surety Bond callable upon demand issued by a reputable surety or insurance company (NPCSF-GOODS-06b) - 5% of ABC, with
    - Certification from the Insurance Commission as authorized company to issue surety
- Duly signed, completely filled-out and notarized Omnibus Sworn statement (Revised) (NPCSF-GOODS-07), complete with the following attachments:
  - For Sole Proprietorship:
    - Special Power of Attorney
  - For Partnership/Corporation/Cooperative/Joint Venture:
    - Document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)
- Data and Information to be submitted with the Bid/Proposal as specified in Clause TS-9.0(a) of Section VI - Technical Specifications
- Complete eligibility documents of the proposed subcontractor, if any

### B. THE 2<sup>ND</sup> ENVELOPE (FINANCIAL COMPONENT) SHALL CONTAIN THE FOLLOWING:

- Duly signed Bid Letter indicating the total bid amount in accordance with the prescribed form (NPCSF-GOODS-08)
- Duly signed and completely filled-out Schedule of Requirement (Section VII) indicating the unit and total prices per item and the total amount in the prescribed Price Schedule form.
- For Domestic Bidder claiming for domestic preference:
  - Letter address to the BAC claiming for preference
  - Certification from DTI as Domestic Bidder in accordance with the prescribed forms provided

Standard Form No: NPCSF-GOODS-01

**CONDITIONS:**

1. *Each Bidder shall submit Two (2) copies of the first and second components of its Bid, marked Original and photocopy. Only the original copy will be read and considered for the bid. Any misplaced document outside of the Original copy will not be considered. The photocopy is ONLY FOR REFERENCE. NPC may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.*
2. *In the case of foreign bidders, the eligibility requirements under Class "A" Documents (except for Tax Clearance) may be substituted by the appropriate equivalent documents, if any, issued by the country of the foreign bidder concerned. The eligibility requirements or statements, the bids, and all other documents to be submitted to the BAC must be in English. If the eligibility requirements or statements, the bids, and all other documents submitted to the BAC are in foreign language other than English, it must be accompanied by a translation of the documents in English. The documents shall be translated by the relevant foreign government agency, the foreign government agency authorized to translate documents, or a registered translator in the foreign bidder's country; and shall be authenticated by the appropriate Philippine foreign service establishment/post or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines.*

*These documents shall be accompanied by a Sworn Statement in a form prescribed by the GPPB stating that the documents submitted are complete and authentic copies of the original, and all statements and information provided therein are true and correct. Upon receipt of the said documents, the PhilGEPS shall process the same in accordance with the guidelines on the Government of the Philippines – Official Merchants Registry (GoP-OMR).*
3. *A Bidder not submitting bid for reason that his cost estimate is higher than the ABC, is required to submit his letter of non-participation/regret supported by corresponding detailed estimates. Failure to submit the two (2) documents shall be understood as acts that tend to defeat the purpose of public bidding without valid reason as stated under Section 69.1.(i) of the revised IRR of R.A. 9184.*



Standard Form Number: NPCSF-GOODS-03

**The Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid**

Business Name : \_\_\_\_\_  
 Business Address : \_\_\_\_\_

Name of Contract	a. Owner's Name b. Address c. Telephone Nos.	Nature of Work	Contractor's Role		a.Amount at Award b.Amount at Completion c.Duration	a. Date Awarded b. Contract Effectivity c. Date Completed
			Description	%		

- Notes: 1. The bidder must state only one (1) Single Largest Completed Contract (SLCC) similar to the contract to be bid.  
 2. Supporting documents such as any of the following: Certificate of Acceptance; or Certificate of Completion; or Official Receipt (O.R); or Sales Invoice for the contract stated above shall be submitted during Bid Opening.

Submitted by : \_\_\_\_\_  
 (Printed Name & Signature)  
 Designation : \_\_\_\_\_  
 Date : \_\_\_\_\_



Standard Form Number: NPCSF-GOODS-04

### NET FINANCIAL CONTRACTING CAPACITY (NFCC)

- A. Summary of the Supplier's/Distributor's/Manufacturer's assets and liabilities on the basis of the income tax return and audited financial statement for the immediately preceding calendar year are:

		Year 20__
1.	Total Assets	
2.	Current Assets	
3.	Total Liabilities	
4.	Current Liabilities	
5.	Net Worth (1-3)	
6.	Net Working Capital (2-4)	

- B. The Net Financial Contracting Capacity (NFCC) based on the above data is computed as follows:

NFCC = [(Current assets minus current liabilities) x 15] minus the value of all outstanding or uncompleted portions of the projects under ongoing contracts, including awarded contracts yet to be started coinciding with the contract for this Project.

NFCC = P \_\_\_\_\_

Herewith attached is certified true copy of the audited financial statement, stamped "RECEIVED" by the BIR or BIR authorized collecting agent for the immediately preceding calendar year.

Submitted by:

\_\_\_\_\_  
Name of Supplier / Distributor / Manufacturer

\_\_\_\_\_  
Signature of Authorized Representative

Date : \_\_\_\_\_

Standard Form Number: NPCSF-GOODS-05

**JOINT VENTURE AGREEMENT**

**KNOW ALL MEN BY THESE PRESENTS:**

That this JOINT VENTURE AGREEMENT is entered into by and between:  
\_\_\_\_\_, of legal age, *(civil status)* \_\_\_\_\_, authorized representative of  
\_\_\_\_\_ and a resident of \_\_\_\_\_.

- and -

\_\_\_\_\_, of legal age, *(civil status)* \_\_\_\_\_, authorized representative of  
\_\_\_\_\_ a resident of \_\_\_\_\_.

That both parties agree to join together their capital, manpower, equipment, and other resources and efforts to enable the Joint Venture to participate in the Bidding and Undertaking of the hereunder stated Contract of the **National Power Corporation**.

**NAME OF PROJECT**

**CONTRACT AMOUNT**

That the capital contribution of each member firm:

NAME OF FIRM	CAPITAL CONTRIBUTION
1.	P
2.	P

That both parties agree to be jointly and severally liable for their participation in the Bidding and Undertaking of the said contract.

That both parties agree that \_\_\_\_\_ and/or \_\_\_\_\_ shall be the Official Representative/s of the Joint Venture, and are granted full power and authority to do, execute and perform any and all acts necessary and/or to represent the Joint Venture in the Bidding and Undertaking of the said contract, as fully and effectively and the Joint Venture may do and if personally present with full power of substitution and revocation.

That this Joint Venture Agreement shall remain in effect only for the above stated Contract until terminated by both parties.

\_\_\_\_\_  
*Name & Signature of Authorized Representative*

\_\_\_\_\_  
*Official Designation*

\_\_\_\_\_  
*Name of Firm*

\_\_\_\_\_  
*Name & Signature of Authorized Representative*

\_\_\_\_\_  
*Official Designation*

\_\_\_\_\_  
*Name of Firm*

*Witnesses*

1. \_\_\_\_\_

2. \_\_\_\_\_

**[Jurat]**

*[Format shall be based on the latest Rules on Notarial Practice]*

Standard Form Number: NPCSF-GOODS-06a

### FORM OF BID SECURITY (BANK GUARANTEE)

WHEREAS, (Name of Bidder) (hereinafter called "the Bidder") has submitted his bid dated (Date) for the [name of project] (hereinafter called "the Bid").

KNOW ALL MEN by these presents that We (Name of Bank) of (Name of Country) having our registered office at \_\_\_\_\_ (hereinafter called "the Bank" are bound unto National Power Corporation (hereinafter called "the Entity") in the sum of [amount in words & figures as prescribed in the bidding documents] for which payment well and truly to be made to the said Entity the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

THE CONDITIONS of this obligation are that:

- 1) if the Bidder withdraws his Bid during the period of bid validity specified in the Bidding Documents; or
- 2) if the Bidder does not accept the correction of arithmetical errors of his bid price in accordance with the Instructions to Bidder; or
- 3) if the Bidder, having determined as the LCB, fails or refuses to submit the required tax clearance, latest income and business tax returns and PhilGEPs registration certificate within the prescribed period; or
- 4) If the Bidder having been notified of the acceptance of his bid and award of contract to him by the Entity during the period of bid validity:
  - a) fails or refuses to execute the Contract; or
  - b) fails or refuses to submit the required valid JVA, if applicable; or
  - c) fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders;

we undertake to pay to the Entity up to the above amount upon receipt of his first written demand, without the Entity having to substantiate its demand, provided that in his demand the Entity will note that the amount claimed by it is due to the occurrence of any one or combination of the four (4) conditions stated above.

The Guarantee will remain in force up to 120 days after the opening of bids or as it may be extended by the Entity, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE \_\_\_\_\_ SIGNATURE OF THE BANK \_\_\_\_\_

WITNESS \_\_\_\_\_ SEAL \_\_\_\_\_

\_\_\_\_\_  
(Signature, Name and Address)

Standard Form Number: NPCSF-GOODS-06b

### FORM OF BID SECURITY (SURETY BOND)

BOND NO.: \_\_\_\_\_ DATE BOND EXECUTED: \_\_\_\_\_

By this bond, We (Name of Bidder) \_\_\_\_\_ (hereinafter called "the Principal") and (Name of Surety) \_\_\_\_\_ of (Name of Country of Surety) \_\_\_\_\_, authorized to transact business in the Philippines (hereinafter called "the Surety") are held and firmly bound unto National Power Corporation (hereinafter called "the Employer") as Obligee, in the sum of (amount in words & figures as prescribed in the bidding documents), callable on demand, for the payment of which sum, well and truly to be made, we, the said Principal and Surety bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

SEALED with our seals and dated this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_

WHEREAS, the Principal has submitted a written Bid to the Employer dated the \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_, for the \_\_\_\_\_ (hereinafter called "the Bid").

NOW, THEREFORE, the conditions of this obligation are:

- 1) if the Bidder withdraws his Bid during the period of bid validity specified in the Bidding Documents; or
- 2) if the Bidder does not accept the correction of arithmetical errors of his bid price in accordance with the Instructions to Bidder; or
- 3) if the Bidder, having determined as the LCB, fails or refuses to submit the required tax clearance, latest income and business tax returns and PhilGEPs registration certificate within the prescribed period; or
- 4) if the Bidder having been notified of the acceptance of his bid and award of contract to him by the Entity during the period of bid validity:
  - d) fails or refuses to execute the Contract; or
  - e) fails or refuses to submit the required valid JVA, if applicable; or
  - f) fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders;

then this obligation shall remain in full force and effect, otherwise it shall be null and void.

PROVIDED HOWEVER, that the Surety shall not be:

- a) liable for a greater sum than the specified penalty of this bond, nor
- b) liable for a greater sum than the difference between the amount of the said Principal's Bid and the amount of the Bid that is accepted by the Employer.

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*Page 2 of 2*

This Surety executing this instrument hereby agrees that its obligation shall be valid for 120 calendar days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived.

PRINCIPAL \_\_\_\_\_ SURETY \_\_\_\_\_

SIGNATURE(S) \_\_\_\_\_ SIGNATURES(S) \_\_\_\_\_

NAME(S) AND TITLE(S) \_\_\_\_\_ NAME(S) \_\_\_\_\_

SEAL \_\_\_\_\_ SEAL \_\_\_\_\_

Standard Form No: NPCSF-GOODS-06c

REPUBLIC OF THE PHILIPPINES )  
CITY OF \_\_\_\_\_ ) S.S.

**BID-SECURING DECLARATION**  
**UPGRADING OF ANNUNCIATOR, CONTROL AND PROTECTION SYSTEM OF UNIT NO.**  
**3 AT AGUS 2 HEP PLANT (PR NO. PR NO. MA-A2M23-055)**

To: **National Power Corporation**  
BIR Road cor. Quezon Ave.  
Diliman, Quezon City

I/We<sup>1</sup>, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid-Securing Declaration.
2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the Procuring Entity for the commission of acts resulting to the enforcement of the Bid Securing Declaration under Sections 23.1 (b), 34.2, 40.1 and 69.1, except 69.1 (f) of the IRR of R.A. 9184; without prejudice to other legal action the government may undertake.
3. I/We understand that this Bid-Securing Declaration shall cease to be valid on the following circumstances:
  - (a) Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
  - (b) I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right;
  - (c) I am/we are declared as the bidder with the Lowest Calculated and Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/we have hereunto set my hand this \_\_\_\_ day of \_\_\_\_  
20\_\_\_\_ at \_\_\_\_\_, Philippines.

\_\_\_\_\_  
[Name and Signature of Bidder's Representative/  
Authorized Signatory]  
[Signatory's legal capacity]  
Affiant

**[Jurat]**  
[Format shall be based on the latest Rules on Notarial Practice]

<sup>1</sup> Select one and delete the other. Adopt same instruction for similar terms throughout the document.

Standard Form No: NPCSF-GOODS-07

### Omnibus Sworn Statement (Revised)

REPUBLIC OF THE PHILIPPINES )  
CITY/MUNICIPALITY OF \_\_\_\_\_ ) S.S.

#### AFFIDAVIT

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. *[Select one, delete the other:]*

*[If a sole proprietorship:]* I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

*[If a partnership, corporation, cooperative, or joint venture:]* I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. *[Select one, delete the other:]*

*[If a sole proprietorship:]* As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

*[If a partnership, corporation, cooperative, or joint venture:]* I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. *[Select one, delete the rest:]*

*[If a sole proprietorship:]* The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

*[If a partnership or cooperative:]* None of the officers and members of [Name of Bidder] is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project

Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

*[If a corporation or joint venture:]* None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and
8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:
  - a. Carefully examining all of the Bidding Documents;
  - b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
  - c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
  - d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.
9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.
10. In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.

**IN WITNESS WHEREOF**, I have hereunto set my hand this \_\_\_ day of \_\_\_, 20\_\_ at \_\_\_\_\_, Philippines.

*[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]*

*[Insert signatory's legal capacity]*

Affiant

**[Jurat]**

*[Format shall be based on the latest Rules on Notarial Practice]*



Standard Form No: NPCSF-GOODS-08

### BID LETTER

Date: \_\_\_\_\_

To: **THE PRESIDENT**  
National Power Corporation  
BIR Road cor. Quezon Ave.  
Diliman, Quezon City

Gentlemen:

Having examined the Bidding Documents including Bid Bulletin Numbers *[insert numbers]*\_\_\_\_\_, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to perform **UPGRADING OF ANNUNCIATOR, CONTROL AND PROTECTION SYSTEM OF UNIT NO. 3 AT AGUS 2 HEP PLANT (PR NO. PR NO. MA-A2M23-055)** in conformity with the said Bidding Documents for the sum of *[total Bid amount in words and figures]*\_\_\_\_\_ or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, to supply and deliver the goods and perform other services, if required within the contract duration and in accordance with the scope of the contract specified in the Schedule of Requirements and Technical Specifications.

If our Bid is accepted, we undertake to provide a performance security in the form, amounts, and within the times specified in the Bidding Documents.

We agree to abide by this Bid for the Bid Validity Period specified in Bid Documents and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof and your Notice of Award, shall be binding upon us.

We understand that you are not bound to accept the Lowest Calculated Bid or any Bid you may receive.

We certify/confirm that we comply with the eligibility requirements pursuant to the Bidding Documents.

We likewise certify/confirm that the undersigned, *[for sole proprietorships, insert: as the owner and sole proprietor or authorized representative of [Name of Bidder]*\_\_\_\_\_ has the full power and authority to participate, submit the bid, and to sign and execute the ensuing contract, on the latter's behalf for the *[Name of Project]*\_\_\_\_\_ of the National Power Corporation *[for partnerships, corporations, cooperatives, or joint ventures, insert: is granted full power and authority by the [Name of Bidder]*\_\_\_\_\_ to participate, submit the bid, and to sign and execute the ensuing contract on the latter's behalf for *[Name of Project]*\_\_\_\_\_ of the National Power Corporation.

We acknowledge that failure to sign each and every page of this Bid Letter, including the attached Schedule of Requirements (Bid Price Schedule), shall be a ground for the rejection of our bid.

\_\_\_\_\_  
*[name and signature of authorized signatory]*

\_\_\_\_\_  
*[in the capacity of]*

Duly authorized to sign Bid for and on behalf of \_\_\_\_\_  
*[name of bidder]*

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**Bank Guarantee Form for Advance Payment**

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To: **THE PRESIDENT**  
National Power Corporation  
BIR Road cor. Quezon Ave.  
Diliman, Quezon City

*[name of Contract]*

Gentlemen and/or Ladies:

In accordance with the Advance Payment Provision, of the General Conditions of Contract, *[name and address of Supplier]* (hereinafter called the "Supplier") shall deposit with the PROCURING ENTITY a bank guarantee to guarantee its proper and faithful performance under the said Clause of the Contract in an amount of *[amount of guarantee in figures and words]*.

We, the *[name of the universal/commercial bank]*, as instructed by the Supplier, agree unconditionally and irrevocably to guarantee as primary obligator and not as surety merely, the payment to the PROCURING ENTITY on its first demand without whatsoever right of objection on our part and without its first claim to the Supplier, in the amount not exceeding *[amount of guarantee in figures and words]*.

We further agree that no change or addition to or other modification of the terms of the Contract to be performed thereunder or of any of the Contract documents which may be made between the PROCURING ENTITY and the Supplier, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition, or modification.

This guarantee shall remain valid and in full effect from the date the advance payment is received by the Supplier under the Contract and until the Goods are accepted by the PROCURING ENTITY.

Yours truly,

Signature and seal of the Guarantors

\_\_\_\_\_  
*[name of bank or financial institution]*

\_\_\_\_\_  
*[address]*

\_\_\_\_\_  
*[date]*

### CERTIFICATION AS A DOMESTIC BIDDER

This is to certify that based on the records of this office, (Name of Bidder) is  
duly registered with the DTI on \_\_\_\_\_.

This further certifies that the articles forming part of the product of (Name of Bidder),  
which are/is (Specify), are substantially composed of  
articles, materials, or supplies grown, produced or manufactured in the Philippines. (Please  
encircle the applicable description/s).

This certification is issued upon the request of (Name of Person/Entity) in  
connection with his intention to participate in the bidding for the (Name of Project)  
of the National Power Corporation (NPC).

Given this \_\_\_ day of \_\_\_\_\_ 20\_\_ at \_\_\_\_\_, Philippines

\_\_\_\_\_  
Name

\_\_\_\_\_  
Position

\_\_\_\_\_  
Department of Trade & Industry

