



INDIAN INSTITUTE OF TECHNOLOGY KANPUR

Website: <http://www.iitk.ac.in/>

TENDER DOCUMENT

For

Design, engineering, manufacture, inspection, supply, installation & commissioning of PLC/RTU based SCADA system

TENDER NO.: IITK/CSE/2015-16/62

EMD: INR 19, 000 /- (INR Nineteen thousand only)

SCHEDULE OF EVENTS

Issue of tender document:	11/01/2016;	15.00 Hrs "Indian standard time (IST)"
Pre-bid Meeting:	18/01/2016;	15.00 Hrs "Indian standard time (IST)"
Last date of bid submission:	27/01/2016;	15.00 Hrs "Indian standard time (IST)"

"Certified that this tender document contains a total of 25 pages and each page has been consecutively numbered on both sides from 1 to 25".

INDEX

Design, engineering, manufacture, inspection, supply, installation & commissioning of PLC/RTU based SCADA system

S. NO.	DESCRIPTION	PAGE No.
1.	Title page	01
2.	Index	02
3.	Invitation for bid	03
4.	Section A: Instructions to bidder	04 - 07
5.	Section B: Terms & Conditions	08 - 09
6.	Section C: Employer's Requirement	10 - 17
7.	Annexures	18 - 23
8.	Financial bid	24 - 25



INDIAN INSTITUTE OF TECHNOLOGY KANPUR

INVITATION FOR BID

TENDER NO.: IITK/CSE/2015-16/62

IITK invites sealed offer in two separate **Bid forms (Technical & Financial)** from reputed, eligible & resourceful bidders for the Design, engineering, manufacture, inspection, supply, installation & commissioning of PLC/RTU based SCADA system including numerical relay, multifunction meter, etc. complete in all respect.

S. No.	Description	EMD (INR)	Issue of Tender	Pre-bid Meeting	Last date of submission	Opening of Technical bid	Opening of Financial bid	Completion Period
1	Design, engineering, manufacture, inspection, supply, installation & commissioning of PLC/RTU based SCADA system including numerical relay, multifunction meter, etc. complete in all respect.	19,000 /-	11/01/2016 15:00 Hrs	18/01/2016 15:00 Hrs	27/01/2016 15:00 Hrs	28/01/2016 15:00 Hrs	Shall be informed later after evaluation of technical bids	03 Months (After LOI)

Bids shall be submitted by registered post / speed post / courier service in sealed offer on or before the last date & time of submission as mentioned.

Thanking You,

Yours faithfully,

Dr. Sandeep K. Shukla
Poonam and Prabhu Goel Chair Professor
Department of Computer Science and Engineering
Indian Institute of Technology, Kanpur, India

SECTION-A

INSTRUCTIONS TO BIDDERS

A.1 GENERAL INFORMATION

- A.1.1** Institute invites sealed offer in two separate **Bid forms (Technical & Financial)** from reputed, eligible & resourceful bidders for the Design, engineering, manufacture, inspection, supply, installation & commissioning of PLC/RTU based SCADA system including numerical relay, multifunction meter, etc. complete in all respect.
- A.1.2** This tender document is available on the web site (<http://www.iitk.ac.in/new/tenders-notice>) to enable the bidders to view & download the bid document. The facility of downloading the tender document from website will be closed one day prior to the last date of bid submission.
- A.1.3** At any time prior to the deadline for submission of bid, the Institute may, for any reason, at its own initiative, modify the bid document by amendments. Such amendments shall be uploaded on the website through corrigendum and shall form an integral part of bid document. The relevant clauses of the bid document shall be treated as amended accordingly.
- A.1.4** It shall be the sole responsibility of the prospective bidders to check the website from time to time for any amendment in the tender document. In case of failure to get the amendments, if any, the Institute shall not be responsible for it.
- A.1.5** EARNEST MONEY DEPOSIT
- Earnest Money Deposit of INR 19, 000 /- (INR Nineteen thousand only) is required to be submitted by Demand Draft /Bankers Cheque issued in favor of “The Registrar” payable at IIT, Kanpur.
 - The EMD of all the unsuccessful bidders will be returned as early as possible within the bid validity period. No interest will be payable by Institute on the EMD.
 - The Earnest Money of successful bidder shall be returned after installation.
 - The EMD may be forfeited:
 - (a) If a bidder (i) withdraws or modifies its bid during the period of bid validity specified by the bidder on the bid form; or (ii) Does not accept the correction of errors.
 - (b) In case of a successful bidder, if the bidder fails: (i) to sign the contract with the Institute.
- A.1.6** Tender depositions and tender enquiries, if any regarding clarifications/ interpretation in connection with this tender should be addressed to:
- Financial: Mrs. Meeta Bagga (Phone: +91-512-259-6722; Email: meeta@cse.iitk.ac.in)
- Technical: Dr. Sandeep K Shukla (Phone: +91-512-259-6342; Email: sandeeps@cse.iitk.ac.in)

A.2 SCOPE OF BID

The scope of Design, engineering, manufacture, inspection, supply, installation & commissioning of PLC/RTU based SCADA system shall include, but not be limited to, the items listed below in accordance with this requisition comprises of:

- a) PC based SCADA software.
- b) PLC/RTU based control system with peripherals.

- c) Field devices & accessories such as multi-function meters, numerical relays, ethernet switch, variable transformer, contactor, circuit breaker, toggle switches, indicating lamps, signal cable, control cables, power cable, communication cable etc.

A.3 SITE VISIT

Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid.

A.4 ONE BID PER BIDDER

A bidder is permitted to submit only one bid.

A.5 COMPLETION PERIOD

The completion period indicated in the tender documents is for the entire work of planning, designing, supplying, installation, testing, commission and handing over of the entire job to the satisfaction of the principal investigator

A.6 COST OF BIDDING

The bidder shall bear all costs associated with the preparation & submission of his/her bid & the employer will not be responsible or liable for those costs.

A.7 ELIGIBILITY CRITERIA

- a) Only original equipment manufacturer /Authorized channel partners/Authorized system integrators having letter of support from OEM are eligible to bid.
- b) Bidder shall have the experience of minimum 05 years of carrying out supply & commissioning of latest make PLC/RTU based SCADA systems & has successfully executed similar work. 'Similar work' means of Supply, Erection and Commissioning of PLC/RTU based SCADA system for the industries in India.
- c) The last year annual turnover should not be less than INR 2 Crore per annum (i.e. FY. 2014-15).

A.8 PREPARATION OF BID

A.8.1 LANGUAGE OF BID

The bid and all correspondence related to the bid shall only be written in the English language.

A.8.2 DOCUMENT COMPRISING THE BID

Tender shall be submitted in sealed covers in the form of two-bid system (Technical & Financial bids) in separate envelope. The envelopes should be clearly marked as Part I: Technical bid & Part II: Financial bid and submitted in separate cover bearing the following inscription:

Document: Technical Bid / Financial Bid

Subject: PLC/RTU based SCADA system

Tender enquiry no.: **Due date & time:** **Bidder name & address:**

The bids will be opened in two stages on different dates as indicated. The bid containing Technical specifications and EMD will be opened at 1st stage and if the same is found according to required specifications, the bid containing financial offer shall be opened in 2nd stage.

Part – I (Technical Bid) shall contain: <All documents shall have duly stamped & signed by authorized signatory>

- a) Covering letter listing clearly the enclosures.
- b) Self-attested certificate that it has not been blacklisted or declared non-performer by Union Govt/State Govt/ PSU's.
- c) Earnest Money Deposit (EMD)
- d) Annexure-I to Annexure-V, addendum/corrigendum (if any) shall be submitted with duly signed & stamped tender document.
- e) Technical proposal with system configuration & all the supporting documents as desired such as product datasheets etc.

Part – II (Financial Bid) shall contain:

- a) Financial bid shall contain price schedule only.

A.9 CURRENCIES OF BID & PAYMENT

Prices shall be quoted by the bidders in Indian National Rupees (INR) and payment shall be made in INR.

In-case of imported equipment bidder may quote in any foreign currency at the CIF of that country and payment shall be made after LC opening.

A.10 BID VALIDITY

Bid shall remain valid for 03 months after the date of technical-bid opening. In exceptional circumstances, the Institute may solicit the bidder's consent to an extension of the period of bid validity. The request and the response thereto shall be made in writing. A bidder may refuse the request without forfeiting its bid security. A bidder granting the request will not be required nor permitted to modify its bid.

A.11 CLARIFICATIONS OF THE BIDDING DOCUMENT / PRE-BID MEETING

Prospective bidders requiring any clarification of bidding document may notify the Institute in writing via e-mail to the concern person as indicated in the tender document for bids at least 02 days prior to the date of pre-bid meeting. The bidder may attend the pre-bid meeting. It shall not be mandatory for the prospective bidder to attend pre-bid meeting to be qualified for the bid.

A.12 SUBMISSION OF BIDS

Bids shall be submitted by registered post / speed post / courier service in sealed offer on or before the last date & time as indicated.

A.13 OPENING & PRELIMINARY EXAMINATION OF TECHNICAL BIDS

A.13.1 OPENING & EVALUATION OF TECHNICAL BIDS

Technical bid shall be opened on the date & time as indicated. The bidder's representatives who are present shall sign a sheet evidencing their attendance.

The evaluation committee will carry-out a detailed evaluation of the bids in order to determine whether the bidders are qualified.

A.13.2 CLARIFICATION OF TECHNICAL BIDS

Evaluation committee reserves the right to ask clarification of bidder's technical proposals and ask the bidder to withdraw any deviation to mentioned conditions or any proposal which is not suitable to the requirements.

Necessary clarification required by evaluation committee shall have to be furnished by the bidder within the time given by evaluation committee for the same. In case, in the opinion of evaluation committee a bidder is taking undue long time in furnishing the desired clarifications, his / her bid will be rejected without making any reference.

There is no provision of "SUPPLEMENTARY PRICE PROPOSAL".

A.14 OPENING OF EVALUATION OF FINANCIAL BIDS

A.14.1 OPENING OF FINANCIAL BIDS

Financial bid of only technically qualified bidders will be opened after evaluation of technical bid & recommendation of the evaluation committee. The bidder's representatives who are present shall sign a sheet evidencing their attendance.

A.14.2 PROCESS TO BE CONFIDENTIAL

Information relating to the examination, clarification, evaluation and comparison of bids and recommendations for the award of contract shall not be disclosed to bidders or any other persons not officially concerned with such process. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in the rejection of the bidder's bid.

A.15 AWARD OF CONTRACT

A.15.1 AWARD

The Institute will award the contract to the lowest evaluated successful bidder whose bid has been determined to be responsive to all the conditions of the contract and meeting the techno-commercial specification.

A.15.2 INSTITUTE'S RIGHT TO ACCEPT ANY BID & REJECT ANY BID OR ALL BIDS

The Institute reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract without thereby incurring any liability to the affected bidder(s) or assigning any reason thereof.

A.15.3 NOTIFICATION OF AWARD

A purchase order shall be issued in favor of successful bidder, after due approval of competent authority by the Institute. This shall constitute the formation of the contract. The successful bidder need to submit the pro-forma invoice against the purchase order issued.

SECTION-B

TERMS & CONDITIONS

B.1 SPECIAL TERMS & CONDITIONS

B.1.1 PRICE BASIS

Price basis should be FOR IIT Kanpur.

B.1.2 PAYMENT

- 90% after delivery at IIT Kanpur.
- 10% after successful commissioning & handover at IIT Kanpur.

B.1.3 PENALTY FOR DELAYED SERVICES

Penalty / Liquidated damages shall be charged @1% of the contract value per week subject to maximum of 10% of total order value, in case of delay beyond the stipulated time period.

B.1.4 WARRANTY

Bidder shall warranty all the materials and equipment for a period of minimum Twelve (12) months from the date of final acceptance at site.

If any defects or mal-performance occur during the warranty period, Supplier shall visit site & make all necessary repairs & replacements, updates/upgrades (available from OEM) for system software & firmware free of cost.

The bidder will obtain written acknowledgement from principal investigator after completion of warranty period for successful sign off of warranty period.

During warranty, the supplier shall be responsible for the 98% uptime of the equipment calculated on monthly basis. Downtime will be reckoned round the clock (24 x 7). The permissible downtime of 8 hours will further be subject to maximum downtime of 24 hours at a stretch at any instance. e.g. if the down time starts 12:00 hours of a day & extends up-to 11:00 hours the following working day, the downtime is calculated as

1st day: 12:00 hours to 00:00 hours = 12 hours; 2nd day: 00:00 hours to 11:00 hours = 11 hours

Total downtime: (23 - 08 - travelling time) hours = 14 hours (Assume travelling time for local vendor = 1 hr)

Availability (%) = $\frac{(\text{No. of working days in a month} \times 24) - (\text{downtime hours during the month})}{(\text{No. of working days in a month} \times 24)} \times 100$

(No. of working days in a month x 24)

Response and Resolution Time: The response time should not be more than 8 hours (exclusive of travelling time) of receipt of complaint. If no spare is required resolution time shall be maximum 24 hours & if spare is required resolution time shall be maximum 168 hours. Beyond that penalty will be enforced & the warranty should be extended by thrice that duration. If availability goes below 95%, penalty will be enforced & the warranty should be extended by five times that duration.

B.2 OTHER TERMS & CONDITIONS

B.2.1 Submission of a bid by a bidder implies that he has read complete tender document and has made himself aware of the scope and specifications of the work to be done.

B.2.2 The bidder shall quote for all the specified brands which are in compliance to technical specifications. Wherever brand / make are not mentioned please ensure to quote only for reputed make meeting national / international standards.

B.2.3 Institute shall have the sole right to assess the performance of the supplier equipment(s) /components, primary / intermediate and or final, and reject the same without assigning any reason / explanation to the supplier if the performance is found to be unsatisfactory. The decision of Institute will be final and binding on the supplier.

B.2.4 Any damage done by the supplier to any existing system or destroy any part of a building, furniture etc. shall be made good by him at his own cost.

B.2.5 Supplier shall follow the best modern practices in the manufacture of equipment notwithstanding any omission in the specifications. Completeness of the equipment shall be the responsibility of the supplier. Any accessories not specifically mentioned in the specifications, but necessary for the satisfactory functioning of the equipment shall be provided by supplier without any extra cost.

B.2.6 On account of security consideration, some restrictions may be imposed by the security staff on the working and movement of men and materials etc. The supplier shall be bound to follow all such restrictions/ instructions and he / she shall organize his / her work accordingly. Nothing extra shall be payable on this account.

B.2.7 FORCE MAJEURE

Force majeure shall be limited to War, Riot or Civil commotion, Earthquake, flood, tempest, lightening or other natural physical disaster. Restrictions imposed by the Government or other statutory bodies. Supplier shall inform Institute duly certified by the local chamber of commerce or statutory authorities, causes of delay within seven days of the occurrence and cessation of such Force Majeure conditions. Institute reserves the right to cancel the contract if the delay lasting over one month. Bidder shall specify the extent of Force Majeure conditions prevalent in their works at the time of submitting their bid and shall take into consideration in bid. In the event of Force Majeure cause, the supplier or Institute shall not be liable for delays in performing their obligations and delaying period will be extended.

B.2.8 RESOLUTION OF DISPUTES/ARBITRATION

Any difference of opinion arising between Institute and supplier out of or in connection with the contract or its implementation shall be settled amicably. In case of any dispute, the jurisdiction of the matter should invariably remain with the courts situated at Kanpur City (U.P.)

B.2.9 DISCLAIMER

This document is not an agreement and is not an offer to any party. The purpose of this document is to provide bidders with information to assist the formulation of their proposal submission. Each bidder should conduct its own site inspection and should check the completeness of the information in this document and obtain independent advice from appropriate sources. Institute may in their absolute discretion, but without being under any obligation to do so, update, amend the information in this document.

B.2.10 REJECTION OF BIDS

- a) Any information furnished by the applicant found to be incorrect either immediately or at a later date, would result in rejection of the application at any stage or to cancel the contract if awarded, and shall render him liable to be debarred from tendering in future.
- b) In the case of any tender where unit rate of any item/ items appear unrealistic, such tender will be considered as unbalanced and in case the bidder is unable to provide satisfactory explanation such a tender is liable to be disqualified and rejected.
- c) Schedule of quantities and rates should be carefully and properly filled in. The rates should preferably be quoted both in words & figures. Any cutting, overwriting, alterations in the bidding documents should be avoided. Failure to do so may cause rejection of the bid.

SECTION –C

EMPLOYER'S REQUIREMENT

C.1 APPROVED MAKES

1	PLC / RTU	Siemens / GE / ABB / Schneider / Schweitzer / Rockwell
2	SCADA	Siemens / GE / ABB / Schneider / Rockwell
3	Ethernet switch	Siemens / GE / ABB / Schneider / Schweitzer / Phoenix / Moxa
4	Firewall	Siemens / Cyberoam / Phoenix / Cisco/Schweitzer
5	Multi-function meter	Siemens / GE/ ABB / Schneider / Schweitzer
6	Numerical Relay	Siemens / GE / ABB / Schweitzer
7	Switchgear	Siemens / L&T / Schneider
8	Enclosure	Rittal / Pyrotech / Equivalent
9	Cable	Lapp / Equivalent
10	CT	Risabh / AE / Kappa / Reputed
11	PT	AE / Kappa / Reputed

C.2 CODES AND STANDARDS

Complete Design/manufacturing, testing and commissioning including integrate testing and commissioning shall conform to industry standards (IS/IEC/IEEE), Other authoritative national/ international standards or statutory regulations currently in force in the country shall be acceptable at the Owner's discretion, if the requirements equal to or exceed the above mentioned standards. The bidder shall furnish complete information and details concerning the standards to which proposed equipment complies.

The design material, construction features, manufacture, inspection and testing of PLC/RTU shall comply with all currently applicable statutes, regulations and safety codes. If any such standards are not applicable then the same shall comply with the available recommendations of professional institutes like NEMA, IEC, ANSI, ISA, IEEE, DIN and VDE.

In case of any contradiction between various referred standards/ specifications/ datasheet and statutory regulations, the following order of priority shall govern:

- Statutory regulations
- This specification
- Electrical General Specification.
- Codes and standards

C.3 GENERAL REQUIREMENT

All hardware shall be manufactured, fabricated, assembled, finished, and documented with workmanship of the highest production quality and shall conform to all applicable quality control standards of the original manufacturer and the bidder. All hardware components shall conform to latest products based on industry standard.

The specification contains minimum hardware requirement. However, the bidder shall provide hardware with configuration equal or above to meet the technical, functional & performance requirement. Any hardware /software that are required to meet functional, performance & availability requirement shall be provided by bidder & the same shall be mentioned in the BOQ at the time of bid.

The proposed system shall be designed for an open & scalable configuration, to ensure the inter-compatibility with other systems of the utility, the future smooth expansion as well as the easy maintainability.

PLC/RTU based SCADA Lab comprises of 01 EOWS (Engineering cum operating workstation), 01 SCADA web-client, 01 HMI, PLC/RTU hardware, Numerical relay, Multifunction meter, Field instruments etc. but not limited to. The test setup comprises of following cases

C.3.1 3 Phase Power distribution line comprising of variable transformer, CT, PT, Digital protective relay, circuit breaker / contactor provide a comprehensive combination of protection, fault-locating feature, monitoring, control & communication.

Digital protective relays will be used to protect system circuit & devices including feeder by faults like over- & under frequency, over- & under voltage, overcurrent (instantaneous or time –defined), CT-failure, PT-failure, transducer feedback cable failure etc. protective relay can auto reclose a circuit breaker / contactor under normal conditions.

Numerical relays shall provide extensive metering capabilities. Metered quantities are current, voltage, frequency, power, energy, Load profiling etc.

Numerical relay will collect current & voltage signals directly from the instrument transformers & additional information such as trips & alarms. Numerical relay will integrate with SCADA system using PLC / RTU or Ethernet switch.

3 Phase power distribution line comprising of variable transformer, CT, PT, MFM, PLC/RTU, circuit breaker / contactor provides a comprehensive combination of protection, monitoring, control & communication.

PLC/RTU will be used to protect system circuit & devices including feeder by faults like over & under frequency, over- & under voltage, overcurrent (instantaneous or time –defined), CT-failure, PT-failure, transducer feedback cable failure etc. PLC/RTU can auto reclose a circuit breaker under normal conditions.

Multifunction meters shall provide extensive metering capabilities Metered quantities are current, voltage, frequency, power, energy etc.

C.4 MODES OF OPERATION

C.4.1 LOCAL MODE:

It shall be possible to manually operate all the field equipment's individually from the electrical panel / local panel.

C.4.2 REMOTE MANUAL MODE:

It shall be possible to execute every operation in Remote Manual mode. This mode shall be operated from mimic screens by pressing the respective control buttons of field equipment's as configured on the screen.

C.4.3 AUTO MODE:

This mode will be initiated through mimic screens. Auto mode shall be separately selected for a group of operations. Once the start button is pressed relevant operations shall be completed as per the given / timings / interlocks. In case of a problem, the changeover to Remote Manual mode shall be bump less without affecting the process.

C.4.4 EMERGENCY HARDWIRED INTERLOCKS

Interlocks for emergency stops shall be hardwired in to the appropriate circuit to protect personnel and equipment. They shall operate in all modes of control. They shall latch and require to be manually reset.

C.5 SCADA SOFTWARE

C.5.1 SCADA software of minimum 100 tags chosen shall have a proven record of use for industrial applications. SCADA software that enables the rapid creation of standardized, visualization applications and deployment

with brilliant graphics, unsurpassed connectivity, the industry's best support and the broadest partner ecosystem.

- C.5.2** SCADA software shall be easily configured and optimize device connectivity & maximizing the value of data and converting it to useful & actionable information.
- C.5.3** SCADA software shall be capable to generate real & historical trends, events & alarms through interactive visual analysis or dashboard for instant diagnosis of alarms, causes and consequences.
- C.5.4** High-performance database server shall be provided which is capable of storing huge volumes of data generated, to allow trending, sequence of event reports, waveform capture, and other analytical work.
- C.5.5** Stored data shall be capable to integrate Microsoft Office or other open platforms, allowing novices to publish historical reports over the network.
- C.5.6** Process graphics, trends, dashboards, alarms & events are all viewable through a secure web client.
- C.5.7** System shall have broad set of communication protocols such as IEC 60870-5-101/IEC 60870-5-104; IEC-61850/ IEC 60870-5-103; DNP3 etc.

C.6 ENGINEERING-CUM-OPERATING WORKSTATION

"Free issued by the Institute", However Vendor shall furnish minimum hardware /software specification requirement.

C.7 A4 COLOR PRINTER

"Free issued by the Institute", However Vendor shall furnish minimum hardware /software specification requirement.

C.8 ONLINE UPS

"Free issued by the Institute", However Vendor shall furnish minimum rating.

C.9 ALARM/ANNUNCIATION

When there will be an alarm, pop-up will blink in SCADA / HMI, until it is acknowledged. After acknowledgement the alarm will be steady. The alarm will be in this state until fault is persisting and the reset is not pressed. After removing the fault, operator can press the reset button to reset the alarm. After resetting, the alarm will disappear provided the fault is removed. If the fault is not removed, it will again appear in flashing.

C.10 PLC HARDWARE

- C.10.1** The equipment to be supplied shall comprise PLC / RTU complete with mounting racks, power supply, processor, memory modules, communication modules, I/O cards, IO connectors, mounting accessories.
- C.10.2** PLC / RTU controller shall be high performance processors with modular configuration, high reliability, self-diagnostic facilities, and watch dog timers to identify faults at card levels.
- C.10.3** PLC / RTU controller shall have a real time clock capability to accept a time synchronization pulse from external communication system and adjust its internal clock with the pulse.
- C.10.4** The size of PLC / RTU controller memory shall be sufficient for storage of the program instructions required by the logic schemes. Offer shall indicate the amount of memory occupied by the actual program & spare capacity of 50% available for later program modifications or additions.
- C.10.5** PLC / RTU controller memory shall be non-volatile. However, in case volatile memory is provided, battery backup shall be provided for a minimum of one (1) months to keep the stored program intact.
- C.10.6** Supplier shall provide 32 – Digital inputs (SOE), 16 – Digital outputs and 08 – Analog inputs (4-20mA).

- C.10.7** The event of an individual process status shall be logged with the corresponding time (time stamp). This provides information that allows observing and evaluating the sequence of events in the process. DI module shall be capable to support time stamp.
- C.10.8** PLC shall support minimum communication protocols like IEC 60870-5-101 / IEC 60870-5-104 / IEC 61850 etc.
- C.10.9** Toggle switches for DI (these toggle switches are in parallel configuration with terminals for field wiring. DI shall be generated via toggle switch during unavailability of feedback from field); indicating lamps for DO (these indicating lamps are in parallel configuration with output relay. Indicating lamp shall energize via DO command during the unavailability of field device)

C.11 MANAGED ETHERNET SWITCH

Managed multi-port Ethernet switch shall be considered which continues to operate without dropping any packets at the specified extreme environmental conditions. Minimum 08 copper ports shall be considered in the Ethernet switch.

C.12 GPS CLOCK

Supplier shall provide GPS clock for time synchronization of IED's, PLC/RTU, PC etc. System requires precise time synchronization for sequences of event logs, fault recordings, and wide area protection systems.

C.13 ENCLOSURE/PANEL:

All panels shall be minimum IP40 grade & free from imperfections like pinholes, orange peels, runoff paint, etc. All cabinets shall have panel light, ventilation fan, louvers with dust cover, indicating lamps, tempered glass door, fixed or sliding shelf for toggle switches etc. Separate redundant power supply is required for power distribution & interrogation voltage.

C.13.1 BUS

Bus shall be of high conductivity aluminum / copper conductor, supported on insulators made of non-inflammable material and shall have uniform current ratings throughout their length. Bus, bus joints and supports shall be capable of withstanding dynamic and thermal stresses of the specified short circuit currents for 1 second. High tensile strength steel bolts, nuts and washers shall be used for all bus joints and supports.

Clearances between terminals at components shall be as per applicable individual standards for components. Complete bus shall be insulated with heat shrink PVC sleeves of 1100 V grade. Red, yellow & blue color shall be used for phase bus and black color shall be used for neutral bus.

C.13.2 NUMERICAL RELAY

Feeder protection relays provide a comprehensive combination of protection, fault-locating feature, monitoring, control & communication. It will be used to protect system circuit & devices including feeder by faults like short-circuit, over- & under frequency, over- & under voltage, overcurrent (instantaneous or time – defined) etc. Some of in-built features are Sequential events recording, Event reports & load profile, Directional protection, High impedance fault detection, Programmable auto-reclosing etc.

It shall provide extensive metering capabilities. Metered quantities are current, voltage, frequency, power, energy etc. & records most recent metering quantities & events into non-volatile memory, flash memory.

C.13.3 MULTIFUNCTION METER

MFM shall be capable to measure true RMS electrical parameters: per phase voltage, current, demand, W, VA, VAR; Integrated parameters: kWh, kVARh, kVAh; Neutral current, frequency, Power Factor, % Load, % Unbalance (V&I), Phase angle; Onhours, Runhours & Interrupts.; 4 Quadrant energy : bi-directional, absolute & net; Demand: sliding & fixed block; Total Harmonic Distortion (THD) measurement for both Voltage and Current circuit. MFM shall be capable to display alpha numeric bright display; Brilliant 3 line, 4 digit per line;

LED display with auto-scaling capability for kilo, Mega, Giga; View 3 parameters together; Password protection for setup parameters; User selectable default display page through keypad lock. MFM shall have communication capability for integration with energy management systems like RS-485 or Ethernet port.

C.13.4 CABLE

Minimum 1.0 sq.mm multi strand armoured multicore copper conductor PVC insulated & sheathed cables for control purposes for use on AC or DC voltage.

Minimum 2.5 sq.mm multi strand armoured multicore copper conductor PVC insulated & sheathed cable for electric power supply.

C.13.5 WIRING & TERMINALS

Wiring shall be neatly arranged and suitably supported. No metallic clamps shall be used to hold bundles of wired in place. Each wire shall be identified at both ends by PVC ferrules. A minimum of 30% spare terminals shall be provided on each terminal block. Sufficient terminals shall be provided on each terminal block to ensure that no more than one outgoing wire is connected per terminal.

C.13.6 LABELS

Single line circuit diagram showing the arrangements of circuit inside the distribution board shall be pasted on inside of the panel door and covered with transparent laminated plastic sheet.

A name plate with panel designation in bold letter shall be fixed at top of the panel. Inside the cabinet, the electrical component, equipment's, accessories like switchgear, contactor, lamp, relays etc. shall suitably be identified by providing stickers.

C.13.7 EARTHING

Each cabinet, console and other equipment supplied as a part of PLC/RTU based SCADA system shall be provided with an earthing lug. All circuit grounds, shields and drain wires of control cables shall be connected to the system ground bus which shall be electrically isolated from Ac mains earthing bus. This bus shall be typically of 25 mm wide and 6 mm thick of copper. Corrugated rubber insulating matting shall be provided in front of all panels. The width of matting shall be one meter.

C.14 INSPECTION & FACTORY ACCEPTANCE TESTS (FAT)

C.14.1 In order to ensure that the FAT will be successfully and expeditiously completed, it shall commence only after the successful completion of a preliminary FAT (Pre-FAT). The intent is for the bidder to detect and correct most design, integration and performance problems before the principal investigator come to the factory for the FAT. The Pre-FAT shall be supervised by the person designated to serve later as the bidder's inspector of the FAT and each test shall be formally signed off by that person. The signed off test results shall be sent to the principal investigator for review 01 week before the principal investigator came to bidder's factory for FAT

C.14.2 All tests shall be made in accordance with the latest edition of specified standards and codes.

C.14.3 Factory Acceptance Tests shall be conducted according to test plan with detailed test procedures. The test plan and procedures shall be submitted by the bidder for review and shall be subject to approval by the principal investigator.

C.14.4 A complete set of system documentation, including design and maintenance documents, user manuals and the test plan and procedures shall be available during the FAT.

C.15 PACKING & FORWARDING

The Supplier shall include and provide for securely protecting and packing the equipment in accordance with the best established practices so as to protect the contents from damage during transit, storage, exposure to heat, moisture or rain.

Notwithstanding the above, the Supplier shall be entirely responsible for loss, damage or deterioration to the materials occasioned by faulty, defective or insecure packing.

The complete material shall be supplied in one lot (part shipment will not be accepted). The bidder shall inform the readiness of the material at-least 01 week in advance. No equipment shall be shipped without written confirmation by the Principal Investigator that the system has successfully passed its FAT procedure.

C.16 ERECTION & COMMISSIONING:

The system shall declare commissioned, when the system runs satisfactorily for a period of 3 days at site. If the system fails to perform for more than 1 hour, then the process is to be repeated again. This process should continue till the system gets commissioned.

C.17 Supplier shall supply 02 sets (hard-copy) of finally approved drawings & 01 set (soft-copy) along with all programming software in 1TB portable Hard-disk. Supplier shall obtain approval on following documents before start of the work. However, the approval of drawings shall not absolve the bidder from his responsibilities for the correctness and completeness.

C.17.1 SUPPLY OF DOCUMENTS FOR THE DRAWING APPROVAL

- System architecture along with description, Bill of Material indicating make, model, quantity etc., Technical specifications of the PLC / RTU system, SCADA and other items offered along with detailed product literature, Panel drawings, Quality Assurance Plan, Factory acceptance test procedure, Functional design specification, IO-List, Wiring-termination details, Cable-schedule

C.17.2 DURING INSPECTION

- Above mentioned documents + Pre-FAT procedure

C.17.3 DURING COMMISSIONING

- As-built drawings, Installation & Operating instructions, Software installation & un-installation procedures, Control philosophy of implemented system, Operation & Maintenance instructions & Trouble shooting write-up etc.

C.18 TRAINING

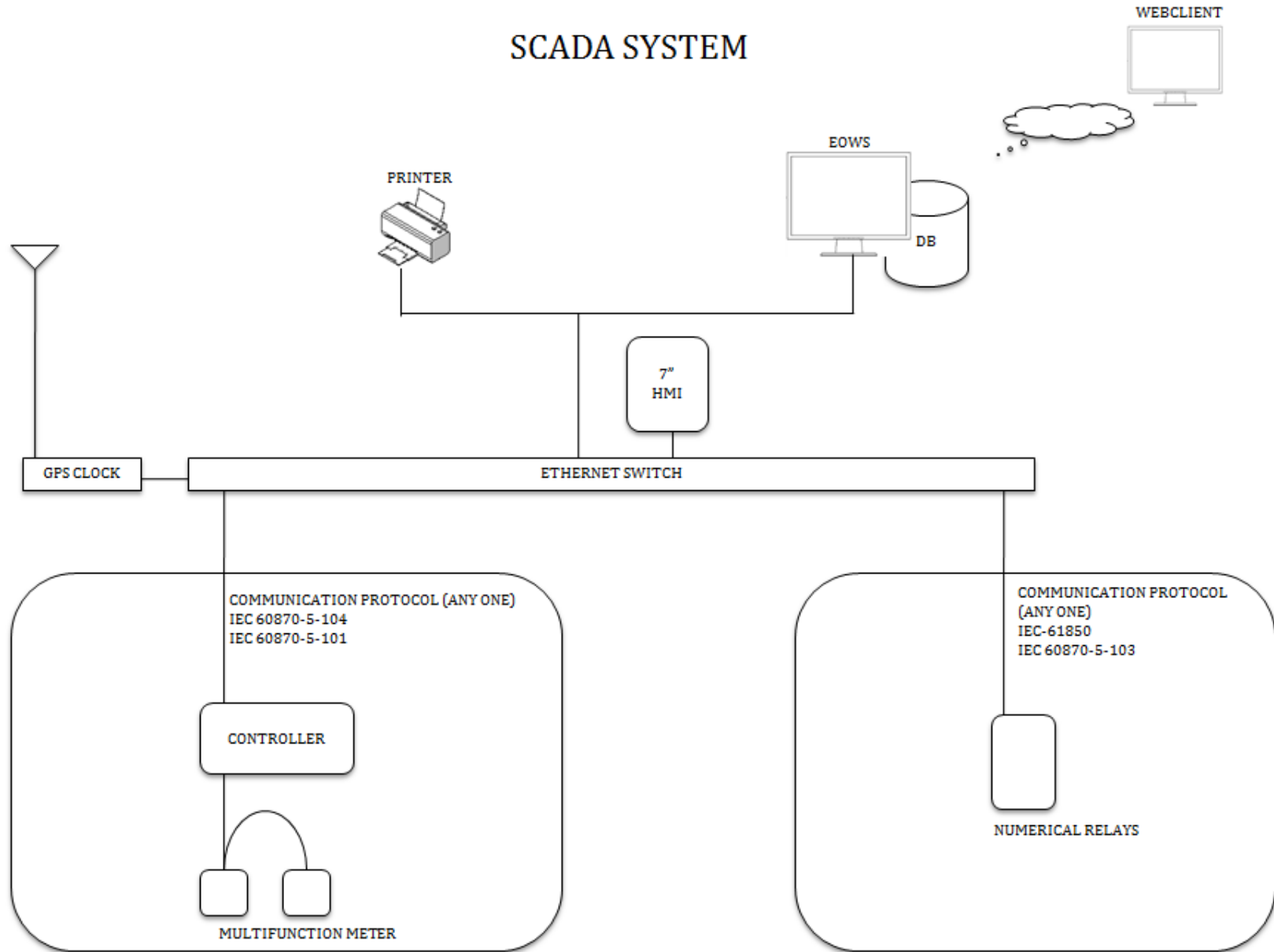
Hands on training of development & configuration, operation & maintenance & trouble shooting aspects of the supplied system to be imparted for a period of 03 Man-Days

C.19 SPARE

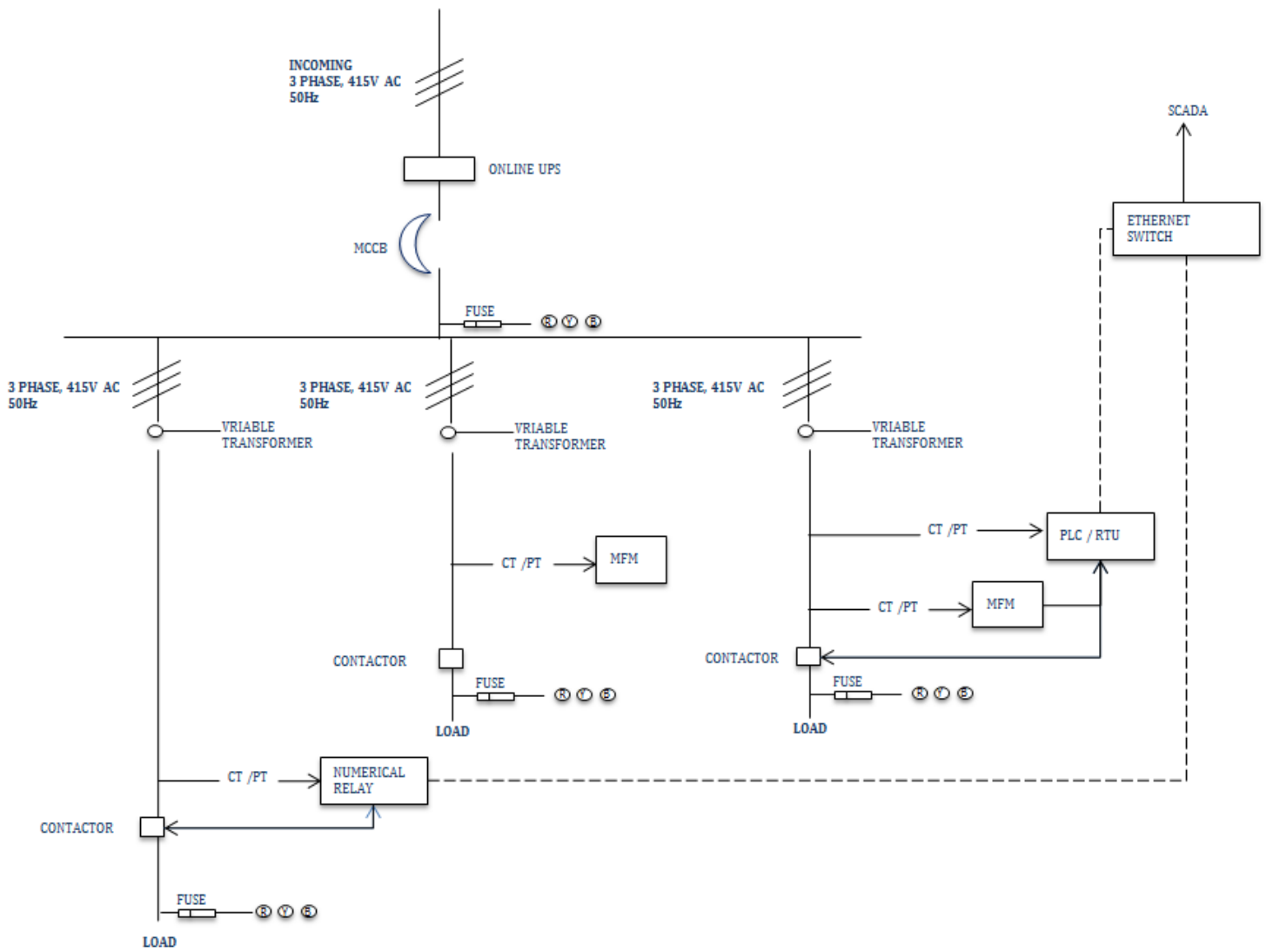
Supplier shall provide a list of spare parts recommended for the trouble free performance (after one year warranty period) of the system offered. Supplier shall supply, at its own expense, all consumables required for use through the warranty period. The consumable items shall include as minimum: fused terminals, toggle switches, push buttons, indicating lamps etc.

SYSTEM CONFIGURATION

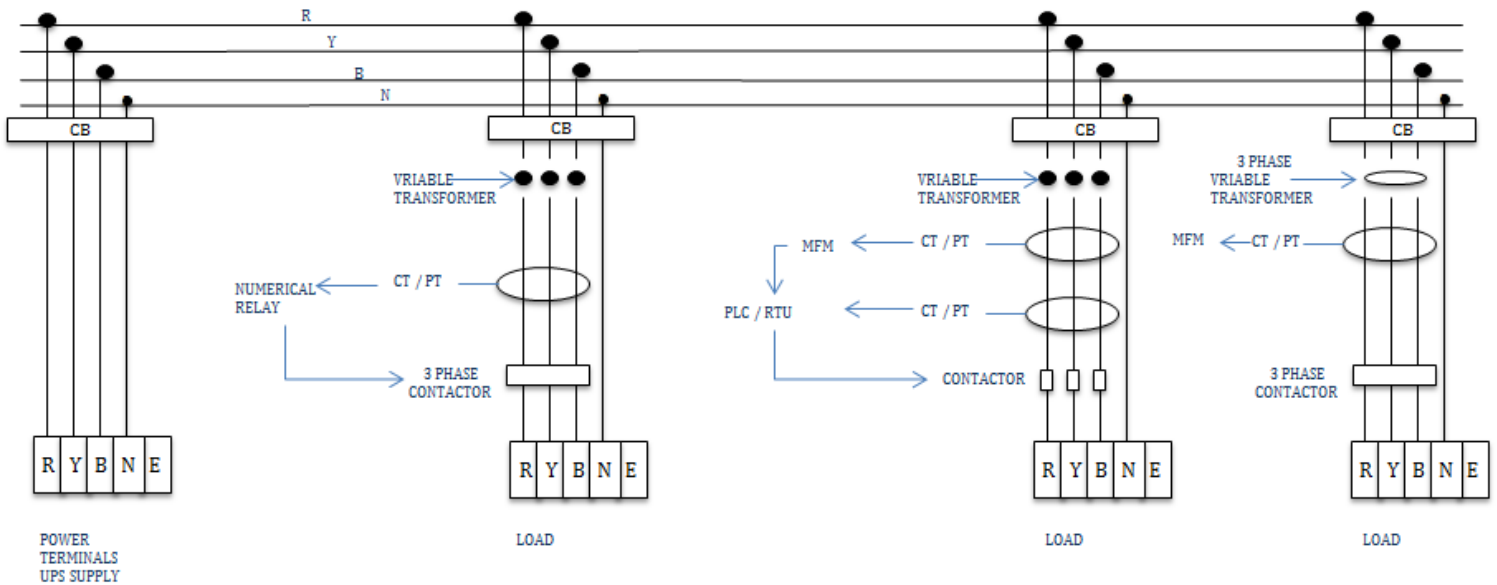
SCADA SYSTEM



TYPICAL SLD: POWER DISTRIBUTION LINE-I & II



TYPICAL BUS ARRANGEMENT



<LETTER HEAD OF OEM>

< (In-case of authorized distributor/system integrator/)>

Dated: _____

To
The Principal Investigator
Department of Computer Science & Engineering
Indian Institute of Technology, Kanpur - 208016

Sub: Letter of Authorization <from OEM (Original Equipment Manufacturer)>

Respected Sir,

With reference to tender enquiry no.: _____, Dated: _____

We hereby authorized M/s. _____ for "Design, manufacturing, inspection, supply, erection, installation, testing & commissioning of PLC/RTU based SCADA system at IIT, Kanpur" for this tender with fully technical recommendation, who will provide you with the techno financial bid on our behalf. The offer from M/s. _____ would be as per our guidelines provided by us.

In the event of an order, the same may kindly be placed on our authorized distributor / system integrator at the following address:

M/s _____

Thanking you and assuring you the best services at all times.

For M/s _____

<Authorized Signatory>

<Duly signed with official stamp>

<LETTER HEAD OF BIDDER>

Dated: _____

To
The Principal Investigator
Department of Computer Science & Engineering
Indian Institute of Technology, Kanpur

Sub: Declaration of No Deviation

Respected Sir,

With reference to tender enquiry no.: _____, Dated: _____, I / We _____ on behalf of
M/s _____ have submitted technical & financial bid.

We understand that any deviation/exception in any form may result in rejection of bid. I / We hereby certify that there is no deviation from the tender conditions either Technical or Financial and I/We am/are agreeing to all the terms and conditions mentioned in the tender document.

We here by confirm that, we have downloaded the complete set of tender document hosted in the website (<http://www.iitk.ac.in/new/tenders-notice>) we confirm that the content of downloaded tender document has not been edited or modified by us. In case, it is observed by Institute that the document has been edited or modified, we agree for the rejection of the bid by Institute.

Thanks

For M/s. _____.

<Authorized Signatory>

<Duly signed with official stamp>

PREQUALIFICATION PERFORMA-I

Company Profile <Attach Xerox copy of related documents as documentary evidence>		
Firm's Name		
Company ownership Proprietary/Partnership/Private Ltd/Public Ltd./CPSU/State PSU		
Office: Address with contact details & web site		
Works: Address with contact details		
Organization Chart		
Name (s) of Proprietor/Directors/CEO		
Official to be contacted (Financial) Name, Designation & Contact details		
Official to be contacted (Technical) Name, Designation, Contact details		
Total no. of full time employees		
Quality System		
Does the Company operate QA/QC manual: Yes/No (if yes, please provide copy)		
Specify QA methodology being carried out		
ISO certified company (Yes/No)		
Financial Status		
Date of Establishment		
Annual Turnover : Last Year (copy of audited annual accounts to be enclosed)		
Taxes and Duties		
E.C.C. No.		
CST No.		
VAT/TIN Nos.		
Service Tax Registration No.		
Income tax filed certificates		
Performance & Other Information		
Completed projects	1. <Project Name>	<Amount><INR>
	2.	
	3.	
Please list any current legal disputes in which your firm may be involved		

Declaration	
I, the undersigned, certify that the information provided in this format is correct.	
Signature of vendor representative	
Name & Designation	
Date and Place	
Stamp of the Organization	

PREQUALIFICATION PERFORMA-II

Firm's Name : _____

Owner's Name : _____

Full Postal Address : 1. _____
 _____ PIN _____
 2. _____
 _____ PIN _____

E-mail address _____

Website address _____

Contact Person's Name _____

Contact No. : Phone No: _____ Mobile No. _____
 Fax No. _____ City _____ State _____

Sale Tax Registration No. : UPTT No. _____ CST No. _____
 (Enclosed Xerox copy) : TIN No. _____

PAN : _____
 (Enclosed Xerox copy)

Shop Act Registration No. : _____
 (Enclosed Xerox copy)

Excise Registration No. : _____
 (Enclosed Xerox copy)

Current Bank Account No. : _____
 (Statement of last twelve months should be enclosed)

Manufacturer or Supplier : _____
 (In case of supplier please enclose authorization of your Principal)

List of the organizations to whom the materials have been supplied

Item(s) name you want to supply : (Major category)

Signature with Seal

Note: Supplier must print CST/UPTT/TIN No. on their Letter Head/Bill/Quotations

TYPICAL LIST OF ITEMS

S. No.	List of items	Model No.	Quantity	Vendor to confirm Quoted/Not Quoted	Remark
1	SCADA Software – EOWS				
2	SCADA Software – Web Client				
3	IEC 60870-5-103 / 61850 driver for SCADA (if any)				
4	IEC 60870-5-101 / 104 driver for SCADA				
5	Database				
6	Minimum 7" color HMI				
7	HMI programming software				
8	Ethernet Switch				
9	Rack / Carrier for PLC/RTU hardware (if any)				
10	Power Supply for PLC/RTU hardware				
11	PLC/RTU controller				
12	Memory card for PLC/RTU controller(if any)				
13	Battery for PLC/RTU controller (if any)				
14	Communication module for mentioned protocols (if any)				
15	DI Module (with SOE)				
16	DO Module				
17	AI Module (4-20mA)				
18	PLC/RTU programming software				
19	Numerical Relay				
20	Numerical Relay programming software				
21	Multifunction Meter				
22	GPS Clock & accessories				
23	Single phase variable transformer				
24	Three phase variable transformer				
25	CT				
26	PT				
27	4-20 mA convertor for CT/PT				
28	Relay card for DO module				
29	Enclosure & accessories				

<LETTER HEAD OF BIDDER>

Dated: _____

To
The Principal Investigator
Department of Computer Science & Engineering
Indian Institute of Technology, Kanpur

Sub: Bid Form

Respected Sir,

With reference to tender enquiry no.: _____, Dated: _____, I/We have read the tender document, general information, instructions, special terms & conditions, other terms & conditions, technical specifications & all other contents in the tender document.

I/We hereby submitting tender for the execution of the work specified for principal investigator within the time specified in tender document and in accordance with all respects so far as applicable.

We agree to keep the bid valid for three months from the date of opening of technical bid thereof and not to make any modifications in its terms and conditions.

An amount of INR 19, 000 /-has been deposited in the form of demand draft / Bankers Cheque of a scheduled bank as earnest money. If I/we fail to commence work as specified, I/we agree that the Institute shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, I/We shall be debarred for participation in the re-tendering process of the work.

I/We hereby declare that I/we shall treat the contract documents, drawings and other records connected with the work as secret/confidential documents and shall not communicate information derived there from to any person other than a person to whom I/we am/are authorized to communicate the same.

I/We understand the Institute is at liberty to accept or reject any or all bids without assign any reason. Institute is not bound to accept lowest or any other bid.

Thanks

For M/s.....

<Authorized Signatory>

<Duly signed with official stamp>

FINANCIAL BID

Dated: _____

To
The Principal Investigator
Department of Computer Science & Engineering
Indian Institute of Technology, Kanpur

Sub: Quotation for design, engineering, manufacture, inspection, supply, installation & commissioning of PLC/RTU based SCADA system

Tender No.: IITK/CSE/2015-16/62

Respected Sir ,

With reference to your enquiry letter on the subject mentioned above, the following quotation is hereby submitted for your consideration, in a sealed cover.

I Supplier Details:

1. Agency / Vendor name :
2. Local Agent :
3. Address :
4. Ph.No :
5. Mobile :
6. Email :
7. Bank A/c No :
8. Bank Name & Add :
9. RTGS / NEFT Code :
10. Registration Details like PAN / VAT / Service TAX etc:

II. Description & Costs of Material / Equipment:

Sl. No.	Complete description / specification of items required	Model No.	No of Units	Unit Price	Total Amount
1					
2					
3					
	Total Cost in INR:				
	a) Free on Rail				
	b) Ex-Work				
	Transportation charges				
	Packing & Forwarding charges				
	Transit Insurance				
	Erection & commissioning charge				
	Other Charge, if any				
	Taxes				
	• Excise Duty / Customs Duty @_____				
	• Sales Tax / CST / VAT @_____				
	• Octroi, if applicable				

	• Service Tax @ _____	
	• Other Duties / taxes	
	Total Value of quotation	

IV. Terms & Conditions:

	Particulars	Description
1	Guarantee/Warranty Yrs.	
2	AMC Value per annum	
3	Costs for additional warranty, if any	
4	No. of Preventive Maintenance Service visits per annum	
5	Validity of quotation	
6	Delivery Period	
7	Method of Payment: (a) ECS (b) Cheque (c) DD (d) CAD (e) TT (f) LC	
8	Payment Terms	
	<ul style="list-style-type: none"> • 90% after delivery at IIT Kanpur. • 10% after successful commissioning & handover at IIT Kanpur. 	
9	Any other details	

Note: The institute is exempted for payment of excise duty under notification number 10/97 & partially custom duty under notification 51/96 & a road permit will provided, if applicable. The concessional form 'C/D' has been abolished w.e.f. April 01, 2007.

Encl: _____

Signature of the authorized signatory

Date & Seal: