

URANIUM CORPORATION OF INDIA LIMITED
P.O. JADUGUDA MINES, JHARKHAND – 832102, INDIA

TENDER DOCUMENT – INDEX SHEET

REF: TENDER NO. PUR / 2 / 34 / 9257 / 597

ITEM: PLC SYSTEM

| SL.NO. | CONTENTS | PAGE NO. |
|--------|--|----------|
| 1 | TENDER OPENING SCHEDULE | 02 |
| 2 | SCOPE OF WORK | 03 - 06 |
| 3 | TECHNICAL SPECIFICATION | 07 - 26 |
| 4 | SPECIFIC TERMS & CONDITIONS FOR SUBMITTING THE OFFER | 27 – 32 |
| 5 | DEVIATIONS | 33 |
| 6 | PROFORMA FOR PRICE BID | 34 - 40 |
| 7 | INSTRUCTION TO TENDERER AND GENERAL CONDITIONS OF CONTRACT | 41 - 43 |
| 8 | PROFORMA FOR BANK GUARANTEE AGAINST SECURITY DEPOSIT | 44 - 45 |
| 9 | PROFORMA FOR BANK GUARANTEE AGAINST WARRANTY | 46 - 47 |
| | TOTAL | 47 |

TENDER OPENING SCHEDULE

| | |
|----------------------|---|
| REF: TENDER NO | PUR / 2 / 34 / 9257 / 597 |
| TENDER DATE | 13.12.2013 |
| ITEM | PLC System |
| SUBMISSION OF TENDER | ON OR BEFORE 29.01.2014 BY 12.30 P.M |
| TENDER OPENING ON | 29.01.2014 |
| AT | 03.00 PM |
| VENUE | PURCHASE DEPARTMENT, UCIL, JADUGUDA |

SCOPE OF WORK

Annexure-1

GENERAL DESCRIPTION:

Uranium Corporation of India Limited (UCIL) is operating a 4500 TPD Ore Processing Plant with state-of-the-art Control and Instrumentation system. The plant involves mainly crushing of ore, grinding, thickening of pulp, filtration, leaching, and precipitation and drying.

PLC based control system has been provided for the above plant. There are 3 Local Panel Rooms (LPR) and 1 Central Control Room (CCR) for the monitoring and operation of the entire plant. All LPR are having PLC system for the independent operation of the respective plant. However, all PLC's are connected to Fiber Optic Network in ring, so that complete information of the plant is available at CCR and even LPR s can also be controlled from CCR.

UCIL is now installing one Rotary Kiln Dryer for Uranium Peroxide plant and one Magnetite recovery plant. Various equipments like Heater, Rotary Kiln, Ball mill, Clarifier, Rougher feeder, field instruments etc are being procured separately. The present specification deals with the PLC System required for providing interface between above equipment and its control system.

SCOPE OF WORK:

The scope of this job consist of design, engineering, manufacture, fabrication, assembly, inspection, testing, packing, transportation, delivery at site, erection and commissioning of control & instrumentation system consisting of PLC System and its Internal panel Wiring, Programming, SCADA development as per purchaser request.

(A) SCOPE OF DESIGN AND ENGINEERING

- ❖ Preparation of elementary drawings, wiring diagrams, layout, terminal details of PLC System.
- ❖ Preparation of Bill of quantities of various hardware and software including PLC Hardware, Electrical Accessories.
- ❖ Final as built drawings (wiring, logic, interconnections etc) of the complete system including loop diagrams.

(B) SCOPE OF SUPPLY

- ❖ Electrical Accessories: MCBs, 24V DC redundant power supply (for field Instruments), Relays, Fused Terminal Blocks with LED indication, Panel wiring material etc.
- ❖ PLC System: CPU, Communication Card, Interface modules, Digital and Analog I/O cards, Racks, Rack power Supplies, Ethernet Switches, Inter-connecting cables, HMI and Logic Software, HMI & Engg. Stations etc.
- ❖ Erection Hardware: Cable Ties, Lugs/ Sockets, Printed Tube Ferrules etc.
- ❖ Panel Earthing & Earthing Material
- ❖ Any other hardware / software required to complete the job but not listed above.
- ❖ 3 copies of approved as build drawings and its soft copy in CD form.

(C) SCOPE OF SERVICES

- ❖ Erection & commissioning of entire hardware covered under scope of supply.
- ❖ Internal wiring & termination of all PLC I/Os from PLC Rack to Terminal Blocks inside PLC panels.
- ❖ Control Logic and HMI development and System Commissioning for Uranium Peroxide plant.
- ❖ Earthing pit and associated cabling.

- ❖ Onsite training on PLC (Logic & HMI) for five persons.
- ❖ One week training on PLC (Logic & HMI) for three persons at training centre of OEM of PLC. All charges (i.e. traveling, lodging & boarding) except training fee shall be borne by the purchaser.

Power Supply Distribution

UPS power shall be provided at a single point in the Control room, further power distribution is in the scope of bidder.

Commissioning

Commissioning is in the scope of the contractor. The PLC input and output shall be calibrated according to the requirement of the purchaser.

EXCLUSIONS:

1. Supply of all Field Instruments i.e. On/Off valve/gates, Control Valves, Flow meters, RTD, Thermocouples, I/P Converters, SOV Operated Diaphragms Valves, Solenoid Valves and Pneumatic Supply Distribution etc.
2. Supply of Control and Instrumentation cables between PLC panel to electrical systems (MCC/VVFD/Thy. Drive), PLC panel to Instrument Junction Boxes & PLC panel to Operator console.

Although supply, erection and commissioning of above hardware is excluded from the scope of present tender but integrated commissioning of C&I system of present tender cannot be done without completing the interface of C&I System with field instruments and electrical system (MCC/VVFD/Thy. Drive). Therefore, contractor of present tender will co-ordinate with other contractors for developing wiring scheme of complete system.

Responsibility of C&I system vendor will be over only after successful integrated commissioning of complete system consisting of PLC System, Field Instruments and Electrical Systems.

CONTROL PHILOSOPHY

Control and monitoring of Peroxide and Magnetite Plants has been envisaged from their respective Control Rooms (CR).

There are two modes of operation for all the drives: Local/ Remote.

- In this Local mode, individual starting & stopping of the drives would be possible from Local Push Button Station. Safety interlocks shall be executed at MCC level.
- In Remote Mode, the operator will give command through console keyboard. Drives, associated with that particular command shall start / stop. Safety, Process and Sequential interlock shall be executed through PLC. The modulating control of the process will be done by the PLC system.

All the drive safety related contacts are taken from the field straight to a PLC Panel in the CR. The auxiliary relays (Quantity 16 nos.) in the Control Panel (CP) will multiply the contacts and send one set to the PLC and the other set of contacts will be used at MCC level to realize the drive safety interlock in all modes of operation

Interface scheme between MCC and PLC is shown elsewhere in the tender document.

JOB DESCRIPTION

Tenderer has to prepare and implement all the control logics (in Ladder logic etc.) and HMI Screens related to the control system. Tenderer has to provide **two independent PLC systems** mounted in Panels at control room of Peroxide plant and Magnetite plants respectively.

Tentative Bill of Material given in the tender document is only indicative. Bidder has to make their own assessment regarding hardware and software requirement of complete job. Unpriced copy of Bill of Material along with System Architecture shall be submitted in the part-1 of their offer.

Existing C&I system is based on Schneider make 'MODICON-PREMIUM Series' PLC system with Citect/ Vijeo Citect SCADA system. The system supplied shall seamlessly communicate with the existing system (PLC & SCADA) for data sharing on MODBUS over TCP/IP. Bidder may visit the site prior to submission of offer to understand the existing system.

Detail engineering of complete project shall be completed within 15 days after issue of L.O.I./Purchase order.

Erection Practices:

Panels

- a) The Tenderer shall arrange for the transportation, unloading and handling of the panels from stores to work site. Prior to installation of the panels, the Tenderer shall inspect the foundation.
- b) The Tenderer shall extend the earthing strip to PLC Panel from the constructed earth (Chemical Earth pit having resistance of 0.5 Ohm)..

Panel Wiring:

- c) All the wires runs shall be properly identified by number tags which shall be provided at both field ends and panel ends.

- d) The wires laid shall not be subjected to excessive tension. Termination shall be made with proper lugs and ferrule.
- e) All wires shall be tested for continuity and insulation as per the latest Indian Electricity Rules before connecting to the instruments.
- f) Control wires must be routed in separate trays and should not be clubbed with power wires under any circumstances.
- g) The control wires must be routed away from strong magnetic and electric fields.
- h) There should be no intermittent joints in the wire.
- i) The wires must be tagged to enable easy identification.
- j) All AC and DC signals shall be routed separately in PLC panel of the proposed system.
- k) Not more than one wire shall be terminated on the each side of terminal blocks. Double Decker / internally shorted terminal blocks shall be used wherever required for distribution purpose.
- l) **Pre printed tube type ferrules with cross termination details** shall be used in all the panels.

Earthing

- m) One no. of Class I earth pit (with Chemical Earthing, resistance upto 0.5 Ohm) have to be provided in the periphery of 30 meters from the control panel.
- n) Proper earthing / grounding shall be done as required for the solid-state electronic devices to reduce the chances of spurious signals etc.
- o) Grounding of panel must be done at two points.
- p) The grounding bus should be of adequate size to keep the total resistance to a minimum.
- q) The shield should be connected to the shield bus after ensuring that the shield is free from any other earthing.

TECHNICAL SPECIFICATIONS

Annexure-2

1. SPECIFICATION of PROGRAMMABLE LOGIC CONTROLLER

1.1. GENERAL

- 1.1.1. The Control System mainly consists of **Programmable Logic Controller system, PLC Panel, Electrical Accessories, Human Machine Interface, Logic Software** etc. **Two independent** PLC Systems have been envisaged for Peroxide and Magnetite Project. Make and model nos. of various parts of PLC System (i.e.: CPU, I/O Modules, Power Supplies, Communication Modules, Racks, HMI Software, Logic Software etc.) of Peroxide and Magnetite Projects same shall be identical for ease in maintenance and reduction in inventory.
- 1.1.2. Scope of the tenderer is limited to Supply, Erection & Commissioning of complete PLC System, Training on PLC Logic and HMI Screen preparation, system back up etc. Cable laying and its glanding and termination at field Junction boxes as well as PLC panel end are excluded from the scope.
- 1.1.3. The purchaser shall be consulted in case of any conflict noticed in this specification. The Tenderer shall not deviate from this specification without the prior approval from the purchaser.
- 1.1.4. **Tenderer shall furnish a detailed list of deviations / confirmations clause-wise described in this specification and data sheet. Tenderer must provide enough supportive reason for the deviations.**
- 1.1.5. **Prime Bidder (whether original PLC manufacturer or not) has to submit a declaration from the original PLC manufacturer OR it's subsidiary in India, that there is no bar in supplying PLC system in Uranium Corporation India Ltd. which is under Department of Atomic Energy . In such case original PLC manufacturer has to supply & service during & after project execution including AMC directly to UCIL for a minimum period of 15 years.**
- 1.2. Instrumentation & Control System envisaged shall consist of a Programmable Logic Control System with integrated monitoring system of the significant variables, this system in accordance with the requirements of the process specifications to provide all operational requirements and safety controls needed for the plant. Any improvement in system design from the Tenderer may be accepted provided the Project Schedule and requirements of the plant remain unaffected.
- 1.3. To effect a complete system for each application in order to ensure perfect performance and safety measures of the equipment / loops supplied by the Tenderer under this specification, any hardware required, shall be in the scope of the Tenderer irrespective of their inclusion in the accompanying document of this
- 1.4. The design of control systems and related equipment will adhere to the principle of "Fail-Safe" operation at all system levels. "Fail-Safe" operation means that loss of signal, loss of excitation or failure of any component will not cause a hazardous condition while at the same time prevent occurrence of false trips.
- 1.5. Application of sound maintainability principles and techniques including the following should be followed.
 - Standardization of parts
 - Minimum use of special tools
 - Modular replacement
 - Grouping of functions
 - Malfunction identification
 - Easy removal, replacement and repair
- 1.6. Rack based PLC I/O rack shall be preferred. However shall be redundant external power supply for I/O Rack may be accepted, in such case dedicated redundant power supply for field instruments shall be provided.

- 1.7. **Calibration of Field mounted Smart Transmitter (HART Devices) shall be done from PLC terminal.**
- 1.8. Alarm: The Time Stamping for Alarm Registration shall be done in CPU level & not in HMI Level. Resolution of time stamping to be indicated.
- 1.9. It shall be possible to generate and keep historical data log of atleast half of the variable tags for which SCADA license is purchased.
- 1.10. All contacts from MCC for Start/Stop/Trip feed back of LT motors shall have contact rating of 230V AC 5A and the same to be terminated at the I/O Racks.
- 1.11. All Analog Input channels should have isolated grounding; Digital Input may have common ground.
- 1.12. Controllers with following facilities:
 - 1.12.1. The % loading of the processor should be such that the following scan time remain un affected:
 - 1.12.2. 250 M Sec for all closed Loops & Interlock
 - 1.12.3. 2 Sec for Temperature signal related to monitoring only
 - 1.12.4. 1 Sec for all other Analog & Digital Open Loop.
 - 1.12.5. **Processor shall be Hot Stand by (i.e redundancy shall be hardware based and not software based. There by Switchover time shall be within 100 Milli Sec)**
 - 1.12.6. Controller with PID function, auto-manual switching, remote set point, reversible output, indication of process input, output, set point, alarms at 4 points for each input, integration, high low selection.
 - 1.12.7. Input devices to power and receive 4-20 mA from 2 wire/Non 2 wire transmitter, low value signals from thermocouple/RTDs, Switches etc. Output devices to drive I/P converter, VVFD etc.

2. PLC SPECIFICATION

- 2.1. Programmable logic controller (PLC) shall be at least 32 Bit processor based system, which shall be used to execute all the process and safety shutdown interlocks of the plant. **PLC shall be capable of handling Analog loops also.**
- 2.2. **Hardware based Redundancy is envisaged. Software redundancy is not acceptable.**
- 2.3. **SCADA Software shall be OPC (OLE for Process Control) compatible, One OPC server and one OPC client license shall be supplied along with SCADA software.**
- 2.4. **The Digital Output cards shall have 24V DC output, the voltage will drive a relay mounted on relay board to drive the SOV's / Contactor (contact rating 5Amps @ 230V AC).**
- 2.5. The maximum I/O density per card shall be as per following table:

| Card Type | No. of I/O's per card |
|---|-----------------------|
| Analog Input (4 to 20mA, mV) | 16 |
| Analog Input (RTD, Thermocouple, Load cell) | 8 |
| Analog Output (4 to 20mA) | 8 |
| Digital Input | 32 |
| Digital Output | 32 |

- 2.6. The system shall be designed by selecting high-grade components of proven quality and proper design system electronic. Redundancy shall be provide, as minimum, as per this specification to improve system availability and reliability. Due considerations shall be given to the environmental conditions.
- 2.7. The system shall be able to operate satisfactorily from 5°C to 50°C and 5% to 90% non-condensing humidity unless otherwise specified.

- 2.8. The system shall be highly reliable and shall have well proven record of operating satisfactorily in the mineral processing/ chemical plant for a **minimum of Three (03) year for the similar application for the offered PLC platform.**
- 2.9. The PLC shall have very high noise immunity in order to ensure safe and reliable operation when subjected to electrical radio frequency interference and Electro magnetic disturbances expected in a plant.
- 2.10. The system shall have extensive set of self-diagnostics hardware and software for easy and fast maintenance of PLC. Routine checks should run automatically at frequent intervals.
- 2.11. Operation of the PLC shall be completely unaffected by a momentary power loss of the order of 20 Milli Second.
- 2.12. The Scan time of programmable controller shall be a maximum of 50 milli second. Scan time of PLC shall be defined as the cycle time taken by the system to read input, process input executing logic and update control output for all the logic and manipulated variable configured within the system.
- 2.13. On-line replacement of any modules (CPU, Power Supply, I/O Bus, I/O Module & Networking Module) shall be possible in such a way that the removal and addition of any module shall be possible without de-energizing the system. Further there shall not be any interruption in the system while replacing a faulty module except for the inputs/outputs which are being handled by that module.
- 2.14. Tenderer to offer latest version of PLC. Tenderer to produce the document where in date of launching of the product is mentioned. **The offered model shall not be more than 5 Years old.**

2.14.1. SPARE PHILOSOPHY

2.14.1.1. The system shall have following minimum spare capability:

- 2.14.1.1.1. I/O racks of PLC shall have 20% spare slots for installing I/O modules of each type in future. These racks shall be part of the offer. Each installed I/O card shall be such that it can take care of 10% I/O additional input to the existing one.
- 2.14.1.1.2. The processor system shall have the capability to execute logic for these additional I/Os. In addition it shall be possible to extend memory by additional 20% at a later stage.
- 2.14.1.1.3. Power supply module shall be capable to take load of the above mentioned spares.
- 2.14.1.1.4. The PLC console shall have capacity to meet all requirements for the additional input/outputs as mentioned above.
- 2.14.1.1.5. Wherever relays are used to interface process input/outputs with PLC, 20% additional relays shall be provided. In addition 20% spare space shall be provided in cabinets to install 20% additional relays in future.
- 2.14.1.1.6. Wiring/termination and terminals shall be provided to meet spares as mentioned above.

3. SYSTEM CONFIGURATION

3.1. The system shall consist of following major sub-systems:

- 3.1.1. **Input /Output Sub-system** :The I/O modules shall be mounted in the I/O racks located in the control room. I/O devices interface with PLC shall be at I/O racks only. **Channel level Diagnostics of I/O modules is preferred. However, Card level Diagnostics on HMI is the minimum requirement.**
- 3.1.2. Each I/O shall be protected against the reversal of polarity of the power voltage to I/O.
- 3.1.3. Each I/O module shall have a LED per channel to indicate the status of each input/output. For Digital I/O cards common ground may be accepted.
- 3.1.4. The time stamping has to be done in CPU level and not in MMI Level. **CPU, I/O and all related H/W shall be from same series.**
- 3.1.5. Analog Input cards should be able to accept Powered (4 wire instrument) & Non powered Input (Two wire instrument).

3.1.6. Digital output from the PLC shall be Voltage output connected to a relay to provide potential free / dry contacts with contact ratings 220 V AC, 5 Amps.

3.1.7. It is recommended that all I/O shall be fused. Each output shall be short circuit proof and protected by fuse. Visual indication of fuse blown indication must be provided for each I/O.

3.1.8. The communication of I/O system with central process shall be Hot Stand by with complete error checking.

3.1.9. For Analog I/O's there shall be Optical Isolation. For Digital I/O Free Wheel Diode is recommended.

3.1.10. The proposed system shall be hooked to Intelligent MCCs/ VVFDs. Above communication with third party shall be on Profibus / Modbus platform. Supply of 1 no. of Profibus gateway cards and 1 no. of MODBUS gateway cards are included in the scope of above tender.

3.1.11. Hot replacement of any module (CPU Module, Power Supply Module and Communication Module) shall be provided. No output shall be affected while replacing these modules.

4. Processor System

4.1. Hot Stand by Processor i.e. Hardware based switch over is envisaged, so that the switching over time from Primary Processor to Secondary Processor does not take more than 100 Milli Sec. Transfer from primary to secondary shall be bump less i.e. I/O's shall not change its state during the transfer of processor.

4.2. The size of the 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 and spare capacity available for later program modifications or additions.

4.3. Memory shall be non-volatile. However, in case volatile memory is provided, battery back up shall be provided for a minimum of 3 months to keep the program storage intact. A battery drain indication shall be provided at least one week before the battery gets drained. A potential free contact shall be provided for hardwired annunciation in the control room.

4.4. Watchdog timer shall be available, watchdog timer shall continuously monitor the healthiness of processor. Any hardware or software problem in the processor sub-system, which shall include CPU, memory, power supply, communication interface etc. shall cause the watchdog timer to report processor failure.

4.5. PLC processor shall always monitor the status of PLC I/O modules for their healthy condition and annunciate the same through operator console and maintenance printer.

4.6. It shall be possible to generate the first out alarm output by the PLC in case where a group of parameters are likely to trip a system.

4.7. A historical log of logic update/modification shall be available in PLC processor with date and time stamping along with modification done.

5. PLC Console

5.1. The PLC console (Engineering station) shall be used for programming, program storing, fault diagnostics and alarm monitoring. It shall also be possible to use this for plant operation, whenever specified.

5.2. Engineering station shall be a laptop computer.

5.3. PLC console when used for plant operation shall be supplied with dedicated operating keyboard.

5.4. The keyboard shall preferably be touch sensitive sealed type, easy to operate with each key clearly identified. It shall be provided with a lock and key to prevent any unintentional program modification.

5.5. All illegal entries shall be rejected by console and shall be identified by warning signal on LCD Monitor.

5.6. Manual operation / forcing of any element connected to PLC shall be possible from keyboard.

5.7. It shall be possible to modify, add or delete the application program on line without affecting the outputs.

- 5.8. Whenever PLC console is used for the operation of the plant, it shall be able to display process, dynamic graphics. Overview and group displays. It shall be possible to manually force input or output contact connected to PLC. Hardware or software key locks shall be provided to enable the same. The forced inputs shall be highlighted in their respective rungs or shown separately in an identifiable color on the screen.
- 5.9. It shall be possible to printout the logic diagram on the PLC printer. In addition printer shall also be able to print the following.
 - 5.9.1. Diagnostic messages, as and when they appear.
 - 5.9.2. Diagnostic report when called for
 - 5.9.3. Processor alarms connected to PLC as and when they appear and alarm report whenever initiated.
 - 5.9.4. Log of logic modification along with date and time with modification done.**
 - 5.9.5. Shut down report as and when initiated.
 - 5.9.6. I/O map showing status of all inputs and corresponding outputs in a user defined format.
- 5.10. The PLC console shall be provided with self-diagnostics feature which shall display error messages and initiate an audible alarm if the fault is detected.
 - 5.10.1. The diagnostic shall include but not limited to the following:
 - 5.10.1.1. Failure of main or I/O processor
 - 5.10.1.2. Memory faults, both PROM and EPROM
 - 5.10.1.3. Microprocessor faults
 - 5.10.1.4. Communication faults
 - 5.10.1.5. I/O interface or address faults
 - 5.10.2. Voltage signal discrepancy on input and output
 - 5.10.3. Power supply faults
 - 5.10.4. Output loop check

6. Communication Sub-system

- 6.1. The communication sub-system between the processor sub-system & I/O subsystem shall be **Dual Redundant with a minimum speed of 1MBPS**
- 6.2. The proposed system shall be hooked to Intelligent MCCs/ VVFDs. Above communication with third party shall be on Profibus/Modbus platform. Supply of 1 nos. of Profibus and 1 nos. of Modbus gateway cards are included in the scope of above tender.
- 6.3. Our existing PLC communicates on Modbus protocol on TCP/IP, Communication shall be so designed that the existing PLC will exchange data with the offered system
- 6.4. Between HMI & PLC sub system there shall be 1000 MBPS Ethernet TCP/IP with MODBUS application layer protocol. The Network shall be Switched for high throughput Network.
- 6.5. Data redundancy in HMI shall be implemented through 2 Ethernet ports in each CPU. Two Ethernet switch shall simultaneously receive data from both the CPU forming a redundant bus.
- 6.6. SCADA PC will communicate with the redundant bus (both Ethernet switch). Failure of any switch or Ethernet switch will not effect the Communication from PLC to SCADA.
- 6.7. Ethernet switch shall be industrial (Preferably Managed type) type. Each switch shall be fed with two separate power supply in redundant mode.
- 6.8. The mechanism used by the system for error checks and control shall be transparent to the application information /program. Error checking shall be done on all data transfers by suitable codes.
- 6.9. Programmable logic controller shall operate on uninterrupted power supply with following specifications.

6.9.1. Voltage : 230 V AC \pm 5%

6.9.2. Frequency : 50 Hz \pm 1%

6.9.3. Switchover time : 10 Milli second

7. SELF DIAGNOSTICS

- 7.1. The system shall have an extensive set of self-diagnostic routines which shall be able to identify the system failure at least up to module level including redundant components and power supplies through detailed LCD MONITOR displays and report print out.
- 7.2. Diagnostic software shall have the capability to provide information about the failed module / system either in the form of a system configuration display or provide information in the form of 'statement'.

8. SYSTEM SOFTWARE

- 8.1. The PLC programming language for implementation of logic operations shall be based on Boolean Representation.
- 8.2. Tenderer must supply software package to enable the owner to modify/add/delete any part of program in online as well as off-line modes.
- 8.3. System software for I/O map showing status on inputs and the corresponding outputs giving Tag numbers as per logic diagrams in the user defined formats to be provided.
- 8.4. System software for the report generation for reports like hourly on demand, shiftily, daily and weekly report shall be provided whenever specified in job specifications, in the user defined format.
- 8.5. All the hardware covering 100% components shall be checked through elaborate self test features every 10/20 ms. This shall ensure timely isolation of faults and sending appropriate message at the PLC console. This self-test shall consist of but not limited to the following:

In Processor

- i) Self checking of microprocessor
- ii) Self checking of each data bus
- iii) Self checking of each memory module
- iv) Self checking of I/O card diagnostic circuit
- v) Self checking of I/O card addressing circuit
- vi) Self checking of software by watch dog timer
- vii) Self checking of power supply levels
- viii) Self checking of command outputs
- ix) Self checking of each component

In Input Card

- i) Self checking of addressing of inputs
- ii) Self checking of all channel for high and low
- iii) Self checking of inputs by reading
- iv) Send to controller identification codes
- v) Send to controller power supply status

9. PLC PANEL

- 9.1. The depth of the Vertical Stand Alone Panel has been envisaged as 1400 mm. Vertical Stand Alone Panel shall be free standing, enclosed type and shall be designed for bottom entry of cables. Cabinet structure shall be provided with removable lifting lugs to permit lifting of the cabinets.
- 9.2. Vertical Stand Alone Panel's shall be fabricated from cold rolled steel sheet of minimum 2 mm thickness suitably reinforced to prevent warping and buckling. Doors shall be fabricated from cold

rolled steel sheet of minimum 1.6 mm thick. Vertical Stand Alone Panel's shall be thoroughly debarred and all sharp edges shall be grounded smooth after fabrication.

9.3. Sheet metal of consoles/cubicles shall be processed as below:

9.3.1. Pre-treatment as per IS 1477

9.3.2. Phosphating and Painting as per IS 6006

9.3.3. Finished paint thickness 100-150 microns

9.4. Vertical Stand Alone Panel's shall be equipped with full glass at front doors and sheet metal door at rear side of panel. Doors shall be equipped with lockable handles and concealed hinges with pull pins for easy door removal.

9.5. In order to remove dissipated heat effectively from Vertical Stand Alone Panel's, vent louvers backed by wire fly screen shall be provided in cabinet door. Each panel shall also be provided with fans for ventilation as per requirement.

9.6. All inter cubicle and internal signal wiring shall be done using minimum 1mm² stranded copper conductors and power wiring shall be done using minimum 1.5mm² stranded copper conductor. All terminals shall be suitable for minimum 2.5mm² cables.

9.7. PLC Panel shall be IP 42

10. EARTHING

10.1. Class I earthing shall be provided to earth the PLC system. The ground to neutral voltage shall be less 0.5Volts.

10.2. Each cabinet, console and other equipment supplied as a part of PLC system shall be provided with an earthing lug. All these lugs shall be properly secured to the AC mains earthing bus.

10.3. All circuit grounds, shields and drain wires of control cables shall be connected to the system ground bus which is electrically isolated from AC mains earthing bus. This bus shall be typically of 25 mm wide and 6 mm thick of copper.

11. INPUT / OUTPUT DEVICES

11.1. Purpose: To have conditioning effect on low voltage signal and resistance input along with standard 4-20 mA (Powered & Non Powered) Input and contact Input.

11.2. Capacity : AI – Maximum 16 Input, AO – Maximum 8 Output, DI/DO – Maximum 32 Input/ Output

11.3. Scope: The I/O Cards used for Electrical Inputs shall be of fast scan time conforming to Sequence of Event type (1Milli Sec Scan time). Tenderer shall clearly indicate if these devices are included in the offer.

11.4. Digital Output Cards Feature. : All digital outputs cards shall have potential output (Active High) to energize the interposing relay. The contact of interposing relay will give command to external device. The interposing relay should have two sets of contact (2NO + 2NC).

11.5. Isolation: Analog, I/O cards shall be optically isolated. Digital, I/O cards shall have Free Wheel Diode. Ground of each Channel should be separate in case of Analog I/O cards.

11.6. Special feature: Procedure less hot swapping of the card.

12. DATA HIGHWAY & COMMUNICATION

12.1. Purpose : To link all sub-system and nodes data base management

12.2. Type of Network : Switched Network

12.3. Communication : Switched Ethernet TCP / IP

12.4. Redundancy: Dual even if one is disconnected other should take over with diagnostic alarm.

12.5. Speed : 1000 MBPS / 100 MBPS

12.6. Purpose : Communication within sub-system / Third Party Console

12.7. LAN Connectivity: There shall be at least Five nos. of LAN port for the third party system.

12.8. Standard: Tenderer to inform if based on any International Standard.

13. OPERATOR CONSOLE (DESKTOP COMPUTER)

- 13.1. Type : Server Grade Continuous operation
- 13.2. Processor: Intel Xeon E 5507(Quad Core) Processor, 2.26Ghz/ 4Mb cache
- 13.3. FSB: 800MHz
- 13.4. Drive : Digital Versatile Disk (Read /Write)
- 13.5. RAM : 4 GB
- 13.6. HDD : 320 GB SAS 10K RPM
- 13.7. Integrated RAID 01,
- 13.8. Integrated Redundant Power Supply
- 13.9. Integrated Dual Gigabit Ethernet
- 13.10. Slots: 3 PCI Slots
- 13.11. Monitor: 40" TFT monitor
- 13.12. Accessories : Keyboard & Mouse, 4 USB Ports
- 13.13. Warranty: 3 years
- 13.14. Operating system: Windows based
- 13.15. Compatibility: For SCADA software Citect ver 6.0 and Vijeo Citect ver 7.1 along with offered HMI

14. ENGINEERING STATION (LAPTOP COMPUTER)

- 14.1. Processor: Intel core i5-2400 @3.1GHz
- 14.2. FSB: 800MHz or better
- 14.3. Drive : Digital Versatile Disk (Read / Write)
- 14.4. RAM : 4 GB, DDR 3 or better
- 14.5. HDD : 320 GB 7200 RPM
- 14.6. Connectivity: Integrated Gigabit Ethernet, WLAN, Bluetooth
- 14.7. Monitor: 15" TFT monitor, Resolution 1366 x 768 Pixel
- 14.8. Battery: 6 Cell
- 14.9. Ports: HDMI, VGA, 4nos. of USB, 1no. of RS 232
- 14.10. Backlit Keyboard
- 14.11. Warranty: 3 years
- 14.12. Operating system: latest Windows based software (Vendor shall check the performance PLC programming software with the supplied Operating system)
- 14.13. Accessories: Carrying case, power adaptor

15. Ethernet Switch

- 15.1. Type : Industrial Grade
- 15.2. Design: Fan less heat dissipation type.
- 15.3. Power Supply Dual power supply in redundant mode. Connectivity All switches shall be able to accept fiber optical cable connection directly
- 15.4. Operating Temperature : 65°C

16. TESTING AND INSPECTION

- 16.1. On the basis of guidelines specified in these specifications. Tenderers shall submit their own testing and acceptance procedure. For hardware the procedures shall include purpose of test, test definition of input, procedure, results expected and acceptance criteria. For software, it shall include details of method, list of tests, sequence of execution, results expected and acceptance criteria.
- 16.2. The testing and acceptance of the system shall be carried out on the mutually agreed procedures and criteria based on these guidelines and Tenderer standard procedures.
- 16.3. Factory Acceptance Testing (FAT) and Acceptance
- 16.4. Tenderer shall demonstrate functional integrity of the system hardware and software. No material or equipment shall be transported until all required tests are successfully completed and certified 'Ready for Shipment' by owner/ consultant.
- 16.5. Owner/consultant reserves the right to involve and satisfy himself at each and every stage of testing. They shall be free to request any specific test on equipment considered necessary by him, although not listed in this specification. The cost of performing all test shall be borne by the Tenderer.
- 16.6. Tenderer to note that acceptance of any equipment or the exemption of inspection /testing shall in no way absolve the Tenderer of the responsibility for delivering the equipment meeting all the requirements specified.
- 16.7. It shall be Tenderer's responsibility to modify and / or replace any hardware or software if the specified functions are not completely achieved satisfactorily during FAT.
- 16.8. It shall be Tenderer's responsibility to modify and /or replace any hardware or software if the specified functions are not completely achieved satisfactorily during FAT.
- 16.9. Schedule of FAT shall be included in the proposal by Tenderer. The Tenderer shall produce detailed installation, test and commissioning procedures and operating instructions 4 weeks prior to the FAT for review and comment by purchaser
- 16.10. Tenderer shall not replace any component , Module, subsystem unless it has failed and a log of such failures shall be maintained during FAT. If a malfunction of module/ component in a sub-system repeats, the test shall be terminated and Tenderer shall replace the faulty component/module. Thereafter test shall start all over again. If a sub-system fails during FAT and is not repaired and made successfully operation within 4 hours of active repair time after the failure, the test shall be suspended and restarted all over again only after Tenderer has replaced the device into acceptable operational condition. Testing and FAT shall be carried out in two phases. The minimum requirements for testing during these two phases shall be as follows:
 - 16.11. Under first phase, Tenderer shall perform tests at his works to ensure that all components function in accordance with the specification for each type of test. A test report shall be submitted for owner/consultant review within two weeks of completion of this test. All sub-system shall undergo a minimum of 30 days burn out period. Following tests shall be performed by the Tenderer and reports shall be forwarded to owner/consultants:
 - 16.11.1. Quality control test which shall be carried out to assure quality of all components and modules.
 - 16.11.2. System pre-test which shall be of physical check of all modules, racks, cabinets etc.
 - 16.11.3. System power-up test which shall test functionality of all hardware and software.
 - 16.12. Second phase of testing shall systematically, fully and functionally test all hardware and software in the presence of owner/consultant. All sub-system shall be interconnected to simulate, as close as possible, the total integrated system. Following minimum testing shall be carried out:
 - 16.12.1. Visual and mechanical testing
 - 16.12.2. Functional testing

This shall include the simulation of each input and output to verify proper system response. The testing as a minimum shall include:

- i) Complete system configuration loading

- ii) Demonstration of all PLC system builder functions including addition/deletion of an input/output, addition/deletion of a rung/or an element in a rung, generation of dynamic graphics and other view, report generation etc.

16.13. Tenderer shall conduct SAT (Site acceptance test) at site after commissioning

17. INSTALLATION AND COMMISSIONING

17.1. Installation

The Tenderer shall

Unpack and check the system hardware and supervise the transportation from site stores and installation of PLC hardware at its intended locations.

Carry out the laying of system communication network cables and fabricate and install all splices, connections and accessories necessary to provide a complete interconnection between all equipment.

- Terminate all interconnecting cables, communication network, power and earth cables inside the system cabinets and consoles.
- Test the hardware, power supplies, cabling and connection
- Install and pre-test the software programs and data

17.2. Commissioning

17.2.1. Pre-commissioning

The Tenderer shall

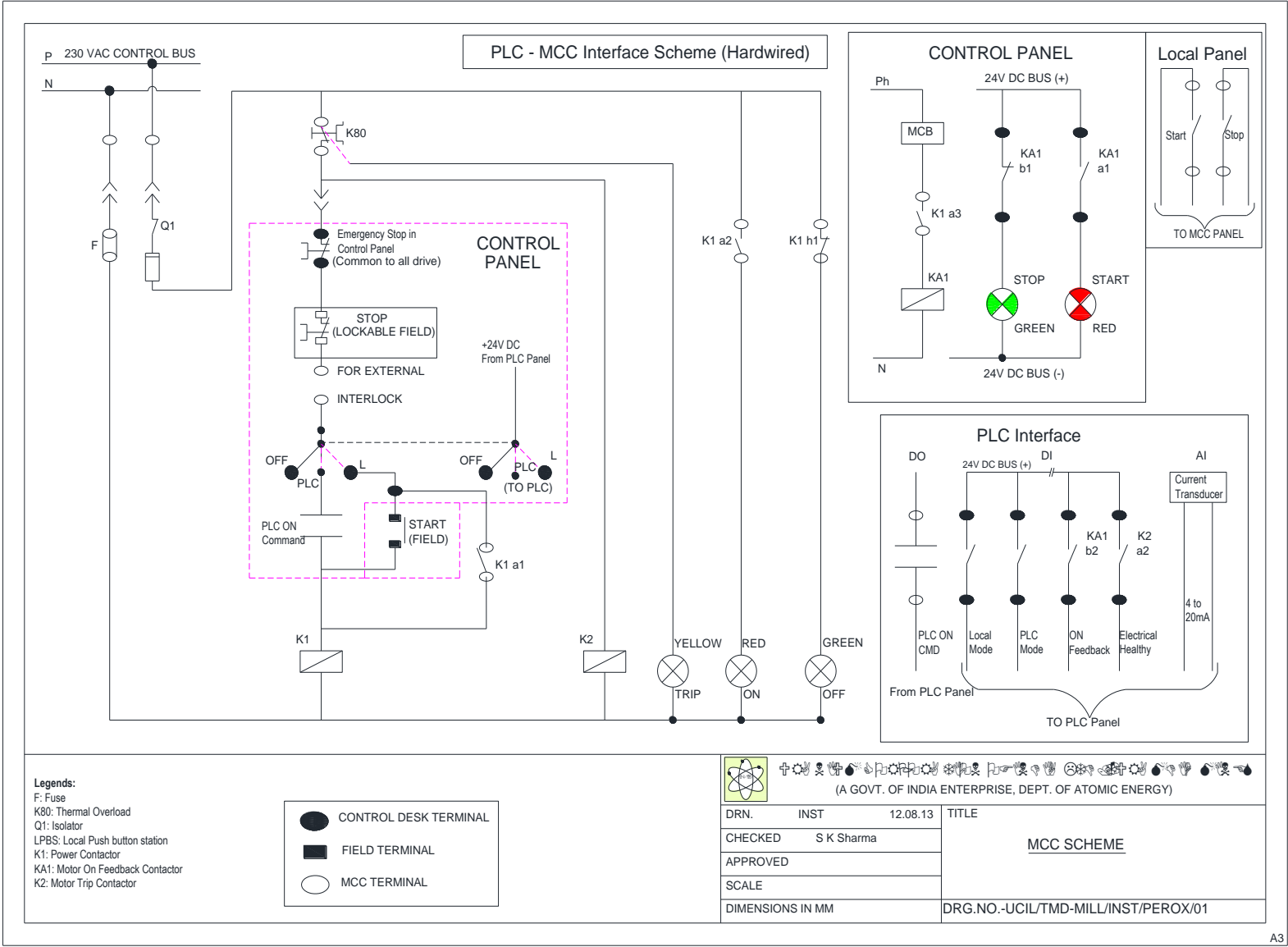
- Test all functions of the system
- Simulate, test and commission all input functions from the incoming terminals at the marshalling cabinets through to the operator interface.
- Test and commission all output and control functions from the operator interface through to the outgoing terminals at the marshalling cabinets.
- Test and commission the complete database
- Test and commission all maintenance and diagnostic facilities.

17.2.2. Final commissioning

The Tenderer shall assist in commissioning all field input and output devices to the system including:

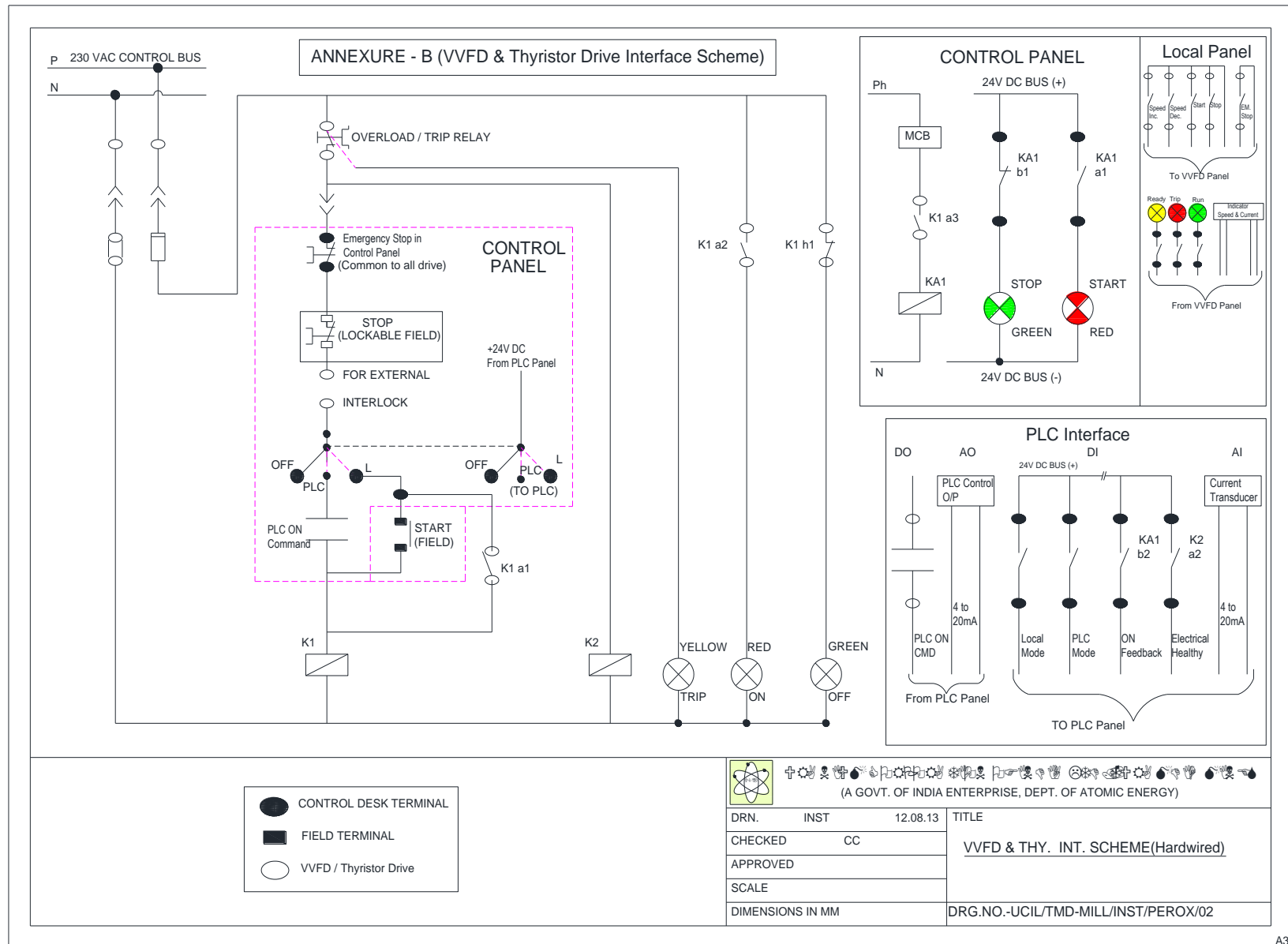
- Commissioning from field device to operate interface
- Reconfiguration and rewriting of the system where necessary
- Start-up and shut-down of the system.

PLC MCC Interface Scheme (Hardwired)



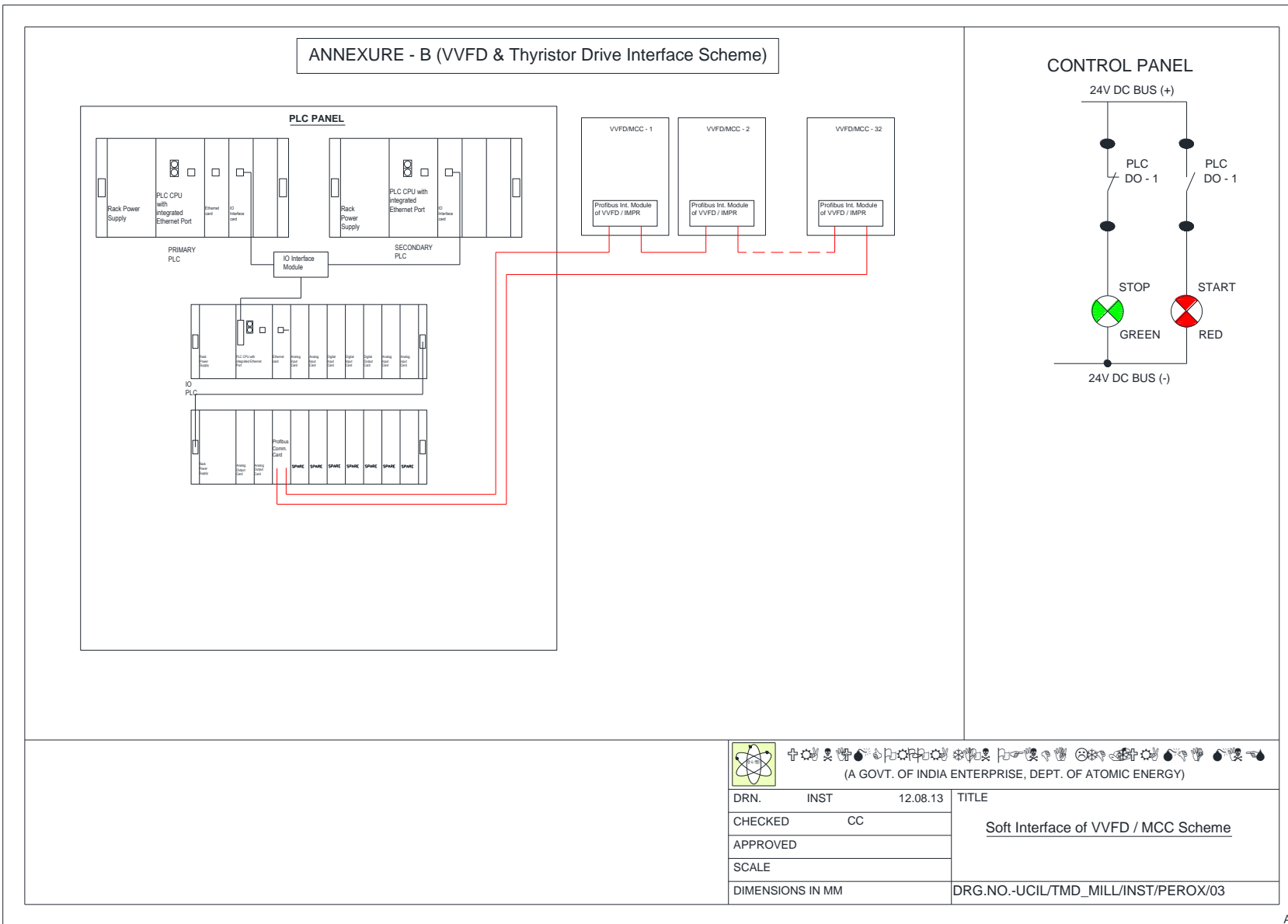
A3

PLC VVFD & Thyristor Interface Scheme (Hardwired)



A3

PLC MCC/VVFD Interface (Soft communication)



The diagram illustrates the electrical connections between the HT Panel and the PLC Panel. The HT Panel includes terminals for various inputs and outputs, while the PLC Panel contains a terminal block for digital inputs and outputs.

HT Panel Connections:

- XC-7, XC-8, XC-9, XC-11, XT-7, XT-8, XC-10:** These terminals are connected to the PLC Panel's MTB-26 terminal block. Specifically, XC-7, XC-8, and XC-9 are connected to the LOCAL input; XC-11, XT-7, and XT-8 are connected to the COMMON input; and XC-10 is connected to the REMOTE input.
- XT-5, XT-6, XT-1, XT-2, XT-9, XT-10, XC-3, XC-4, XSP-23, XSP-24, XSP-15, XSP-16, XSP-07, XSP-08, XSP-13, XSP-14, XSP-9, XSP-10, XSP-11, XSP-12, XTR-1, XTR-2, XTR-5, XTR-6, XTR-9, XTR-10:** These terminals are connected to the PLC Panel's MTB-26 terminal block. Specifically, XT-5, XT-6, XT-1, XT-2, XT-9, XT-10, XC-3, XC-4, XSP-23, XSP-24, XSP-15, XSP-16, XSP-07, XSP-08, XSP-13, XSP-14, XSP-9, XSP-10, XSP-11, XSP-12, XTR-1, XTR-2, XTR-5, XTR-6, XTR-9, and XTR-10 are connected to the LOCAL input.

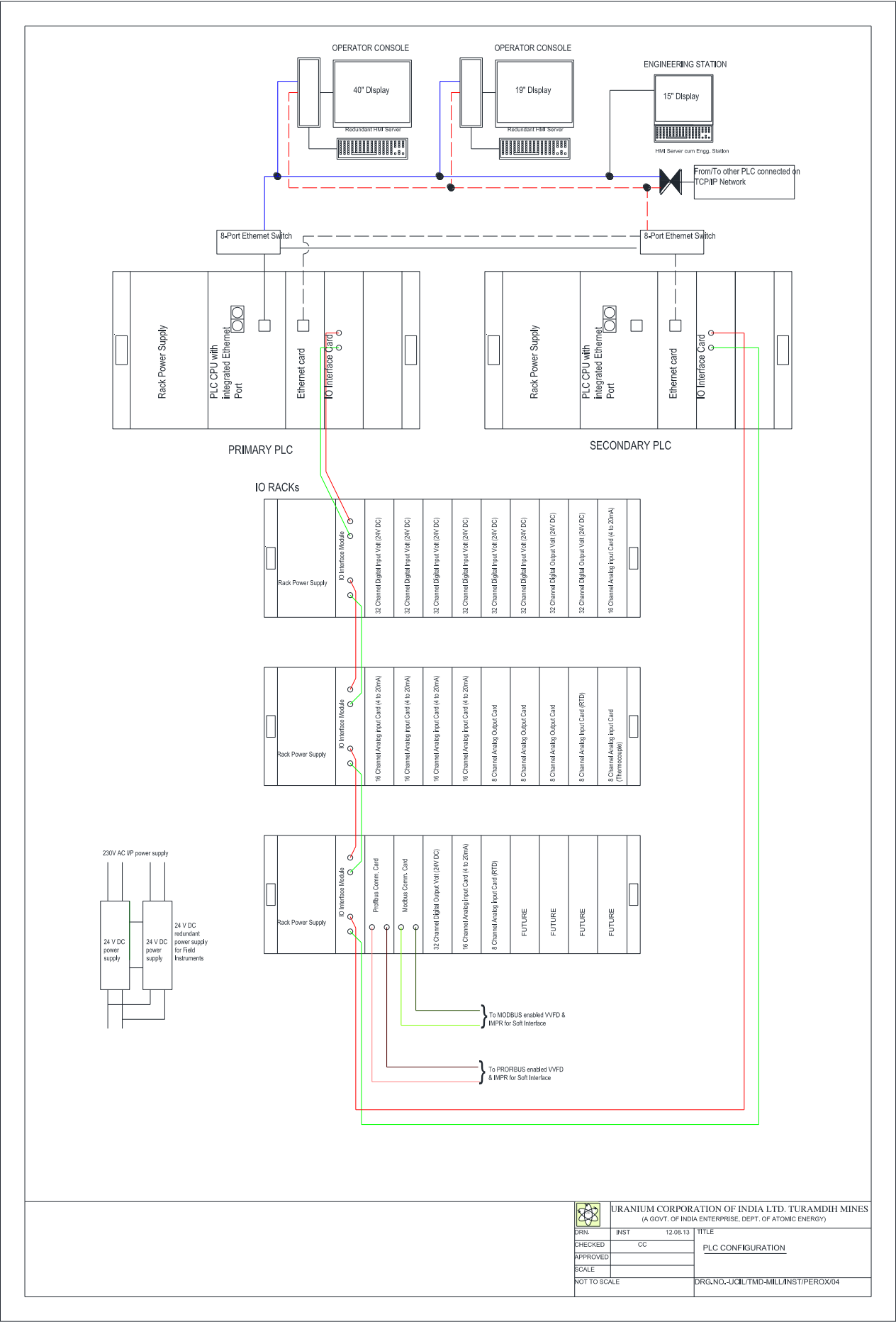
PLC Panel Connections:

- MTB-26:** The terminal block for the PLC Panel, which includes inputs for LOCAL, COMMON, and REMOTE, and outputs for PLC STOP Relay, Temperature Trip Relay, Hardware Interlock (Start), Hardware Interlock (Stop), Breaker-On (Feedback), Protection Operated, Service Position (EH), Auto Trip, Test Position, Trip circuit healthy, Current (R Phase), Current (Y Phase), and Current (B Phase).
- Local Stop:** A button connected to the LOCAL input of the PLC Panel.
- PLC START:** A button connected to the REMOTE input of the PLC Panel.

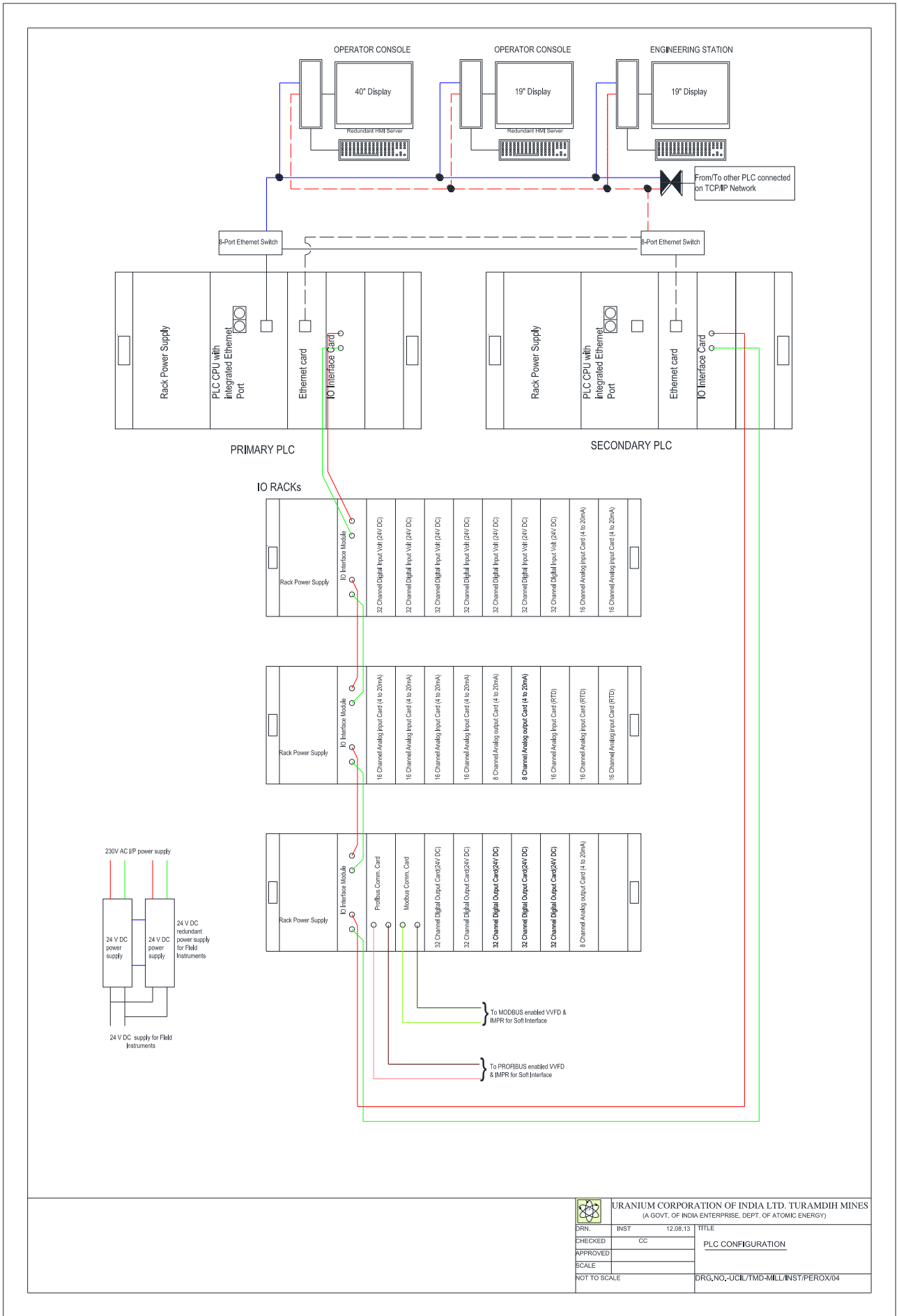
LOCAL REMOTE SELECTION:

The diagram shows a circuit for selecting between Local and Remote modes. A (+) 24v DC Supply is connected to a Selector Switch. The Selector Switch has two positions: SS-1 (Local Mode) and SS-3 (Remote Mode).

PLC Configuration Schematic (for Peroxide Plant)



PLC Configuration Schematic (for Magnetite Plant)



| | | |
|--------------|------|----------|
| | | |
| DRN. | INST | 12.08.13 |
| CHECKED | CC | |
| APPROVED | | |
| SCALE | | |
| NOT TO SCALE | | |

| | | |
|------------------------------------|--|--|
| PLC CONFIGURATION | | |
| DRG.NO.,UCL/TMD-MILL/INST/PEROX/04 | | |

Bill of Material (Supply Part)**1. PLC for Peroxide Plant**

| Sl. No. | Item Description | Unit | Qty. Required | Spare | Total Quantity |
|---------|---|------|---------------|-------|----------------|
| 1 | Central Processing Unit (CPU) | Nos. | 2 | | 2 |
| 2 | Rack power supply | Nos. | 5 | 1 | 6 |
| 3 | 8 slot backplane Rack | Nos. | 2 | | 2 |
| 4 | TCP/IP Module | Nos. | 2 | 1 | 3 |
| 5 | IO interface card (PLC end) | Nos. | 2 | 1 | 3 |
| 6 | I/O interface card (I/O end) | Nos. | 3 | 1 | 4 |
| 7 | 32 Ch Digital Input Card | Nos. | 6 | 1 | 7 |
| 8 | 32 Ch Digital Output Card | Nos. | 3 | 1 | 4 |
| 9 | 16 Ch Analog Input Card (Current & Voltage input universal type) | Nos. | 6 | 1 | 7 |
| 10 | 8 Channel RTD Input Card | Nos. | 2 | 1 | 2 |
| 11 | 8 Channel Thermocouple Input Card | Nos. | 1 | 1 | 2 |
| 12 | 8 Channel Analog Output Card | Nos. | 3 | 1 | 4 |
| 13 | PROFIBUS Interface Card | Nos. | 1 | | 1 |
| 14 | MODBUS Interface Card | Nos. | 1 | | 1 |
| 15 | 12 Position Ex Rack | Nos. | 3 | | 3 |
| 16 | Misc. Hardware (it also includes prefabricated cable from PLC Card to terminal block, ferrule, lugs, mounting base frame, power distribution box, MCB etc.) | Lot | 1 | | 1 |
| 17 | HMI software for 1500 Tags (server version) | Set | 2 | | 2 |
| 18 | Programming License for Engg Station | Set | 1 | | 1 |
| 19 | Operator console with 40" Monitor | Set | 1 | | 1 |
| 20 | Operator console with 19" Monitor | Set | 1 | | 1 |
| 21 | Industrial Grade Ethernet switch | No. | 2 | 1 | 3 |
| 22 | Engineering station | Set | 1 | | 1 |
| 23 | Earthing Material | Lot | 1 | | 1 |
| 24 | Redundant Power Supply 24 VDC, 10A for interrogation and Powering of Transmitters | Nos. | 2 | | 2 |
| 25 | 8 Channel Relay Board (for Interfacing Digital output) | Nos. | 16 | | 16 |
| 26 | 8 Channel Relay Board (for Interlocking in local mode) | Lot | 2 | | 2 |
| 27 | Pre-wired PLC Panel | Lot | 1 | | 1 |

* Only prefabricated interface cable for interfacing I/O card from OEM shall be used in the above system.

2. PLC for Magnetite Plant

| Sl. No. | Item Description | Unit | Qty. Required | Spare | Total Quantity |
|---------|---|------|---------------|-------|----------------|
| 1 | Central Processing Unit (CPU) | Nos. | 2 | 1 | 3 |
| 2 | Rack power supply | Nos. | 5 | 1 | 6 |
| 3 | 8 slot backplane Rack | Nos. | 2 | | 2 |
| 4 | TCP/IP Module | Nos. | 2 | | 2 |
| 5 | IO interface card (PLC end) | Nos. | 2 | 1 | 3 |
| 6 | I/O interface card (I/O end) | Nos. | 3 | 1 | 4 |
| 7 | 32 Ch Digital Input Card | Nos. | 7 | 1 | 8 |
| 8 | 32 Ch Digital Output Card | Nos. | 5 | 1 | 6 |
| 9 | 16 Ch Analog Input Card (Current & Voltage input universal type) | Nos. | 6 | 1 | 7 |
| 10 | 8 Channel RTD Input Card | Nos. | 3 | 1 | 4 |
| 11 | 8 Channel Analog Output Card | Nos. | 3 | 1 | 4 |
| 12 | PROFIBUS Interface Card | Nos. | 1 | 1 | 2 |
| 13 | MODBUS Interface Card | Nos. | 1 | 1 | 2 |
| 14 | 12 Position Ex Rack | Nos. | 3 | | 3 |
| 15 | Misc. Hardware (it also includes prefabricated cable from PLC Card to terminal block, ferrule, lugs, mounting base frame, power distribution box, MCB etc.) | Lot | 1 | | 1 |
| 16 | HMI software for 1500 Tags (server version) | Set | 2 | | 2 |
| 17 | Programming License for Engg Station | Set | 1 | | 1 |
| 18 | Operator console with 40" Monitor | Set | 1 | | 1 |
| 19 | Operator console with 19" Monitor | Set | 1 | | 1 |
| 20 | Industrial Grade Ethernet switch | No. | 2 | | 2 |
| 21 | Engineering station (Spec. as per operator console 'but' with 19" Monitor) | Set | 1 | | 1 |
| 22 | Earthing Material | Lot | 1 | | 1 |
| 23 | Redundant Power Supply 24 VDC, 10A for interrogation and Powering of Transmitters | Nos. | 2 | 1 | 3 |
| 24 | 8 Channel Relay Board (for Interfacing Digital output) | Nos. | 20 | 1 | 21 |
| 25 | 8 Channel Relay Board (for Interlocking in local mode) | Lot | 2 | 1 | 3 |
| 26 | Pre-wired PLC Panel | Lot | 1 | | 1 |

* Only prefabricated interface cable for interfacing I/O card from OEM shall be used in the above system.

LIST OF PREFERRED MAKES & MODELS

FUSES

Larsen & Toubro
Siemens
Ferraz
Maslnad
Cooper Bussmann

TERMINAL BLOCKS

Elmex
Phoenix Contact

LAPTOP

Lenovo
HP

LED Display

LG
Samsung
Sony

SERVER GRADE COMPUTER

Lenovo
HP

D.C POWER SUPPLY

Rockwell automation
Siemens
Schneider
GE Fanuc
ABB
Forbes Marshall

PLC INTERPOSING RELAY

OMRON (Model-G2R-2, 24VDC)
OR Equivalent

PLC HARDWARE & SOFTWARE (Programming & SCADA)

Schneider Electric
Siemens
Ge-Intelligent Platform/ Ge-fanuc
Allen Bradley/Rockwell Automation
ECIL
Forbes Marshall
ABB

MAKE & Model Confirmation (To be submitted along with the Technical Bid)

| Sl. No. | Item Description | Make | Model |
|----------------|---|-------------|--------------|
| 1 | Central Processing Unit (CPU) | | |
| 2 | Rack power supply | | |
| 3 | 8 slot backplane Rack | | |
| 4 | TCP/IP Module | | |
| 5 | IO interface card (PLC end) | | |
| 6 | I/O interface card (I/O end) | | |
| 7 | 32 Ch Digital Input Card | | |
| 8 | 32 Ch Digital Output Card | | |
| 9 | 16 Ch Analog Input Card (Current & Voltage input universal type) | | |
| 10 | 8 Channel RTD Input Card | | |
| 11 | 8 Channel Thermocouple Input Card | | |
| 12 | 8 Channel Analog Output Card | | |
| 13 | PROFIBUS Interface Card | | |
| 14 | MODBUS Interface Card | | |
| 15 | 12 Position Ex Rack | | |
| 16 | Misc. Hardware (it also includes prefabricated cable from PLC Card to terminal block, ferrule, lugs, mounting base frame, power distribution box, MCB etc.) | | |
| 17 | HMI software for 1500 Tags (server version) | | |
| 18 | Programming License for Engg Station | | |
| 19 | Operator console with 40" Monitor | | |
| 20 | Industrial Grade Ethernet switch | | |
| 21 | Engineering station | | |
| 22 | Earthing Material | | |
| 23 | Redundant Power Supply 24 VDC, 10A for interrogation and Powering of Transmitters | | |
| 24 | 8 Channel Relay Board (for Interfacing Digital output) | | |
| 25 | 8 Channel Relay Board (for Interlocking in local mode) | | |
| 26 | Pre-wired PLC Panel | | |

SPECIFIC TERMS & CONDITIONS FOR SUBMITTING THE OFFER

Annexure-4

1. SCOPE OF TENDER:

- a) Design, Engineering, Manufacture, Fabrication, Assembly, Inspection, Testing, Packing, Transportation, Delivery to Site, Erection and Commissioning of Control and Instrumentation System consisting of PLC along with PLC Panel as detailed under SCOPE OF WORK (Annexure – 1).
- b) Delivery of equipments at our site on duly unloaded & insured basis.

2. PREPARATION OF TENDER :

- a) Before submission of the tender, the tenderers are advised to make themselves fully conversant with the conditions of tendering, general conditions, special conditions, site conditions, specifications, schedules, drawings and all other relevant informations so that no ambiguity may arise in this respect subsequent to the submission of the tender.
- b) It shall be responsibility of the tenderer to request for any missing document. In absence of any such request, the tenderer will be deemed to have received and read all documents.
- c) The tenderer shall submit his tender strictly in accordance with the tender specification and terms and conditions laid down in the tender document.

3. STYLE OF QUOTATION – TWO PART TENDER

- a) Quotations are to be submitted in 'DUPLICATE' and to be typewritten or printed on vendor's letterhead. Any correction or overwriting should be authenticated.
- b) The quotation should be in English language only.
- c) The tender will be on two part system, Part-I: consisting of technical & commercial part (except price) & Part-II: consisting of price only. After evaluation of the Techno-commercial offers the Price part of the suitable parties will be opened.

4. PART-1 : TECHNO COMMERCIAL BID (UNPRICED)

It shall contain

- a) Technical details in all respect [Pl. refer TECHNICAL SPECIFICATIONS (Annexure-3)]
- b) Deviations, if any from tender specifications.
- c) Earnest money deposit document
- d) Blank (unpriced) price bid proforma.
- e) Commercial terms & conditions of sale.
- f) List of customers with complete address (phone and fax no.) for the specified equipment quoted, year of supply along with quantity supplied.
- g) Performance reports of equipment from customers.

5. PART-2: PRICE PART: This part shall contain price only. Price part will be required to be submitted in a separate envelope and will contain prices offered for Design & Engineering, Supply parts & Erection and Commissioning **strictly as per our enclosed format.**

6. MODE OF SUBMISSION OF TENDER: Techno-commercial & Price parts will be required to be submitted simultaneously. Techno-commercial part will be designated as part-I. Price part will be designated as Part-II and will have to be submitted as per the price format.

These two parts i.e. one Techno-commercial & one price part should be submitted in the separate envelopes superscribing on the top with (a) Name & address of the bidder (b)

Tender No. (c) Part No. I & II (I for Techno-commercial & II for Price part) (d) Due date.

Personal delivery is recommended. Tenderers forwarding tender by mail shall do so at their own risk. Tender received after due date and hour may not be entertained.

All envelopes duly sealed should be addressed to the Dy.General Manager (Purchase), Uranium Corporation of India Limited, P.O. Jaduguda Mines, East Singhbhum, Jharkhand – 832102. Incomplete offers sent by E-mail / fax are likely to be rejected / ignored.

7. **VALIDITY:** The Offer shall be valid for 180 days initially from the date of tender opening. The validity of the offer shall be extended further if desired.
8. **PRICE TERMS:** Free delivery at our Turamdih Stores / Site on duly unloaded and insured basis.
9. **FIRM PRICE:** Your quoted price will remain firm till execution of entire order quantity.
10. **DESIRED EXECUTION PERIOD:** The time of completion of the total job including supply, erection, commissioning and trial run of the total system is **3 months** from the date of issue of purchase order. However, you should indicate your best delivery schedule.

If there is a delay on our part in installing the plant equipments, then you will have to supply the complete items (under the scope of supply) and install all the instruments for which clearance has been given within stipulated time. However, for rest of the instruments, you will have to complete the job within 30 days after the site clearance is given.

11. PAYMENT TERMS:

a) Design Engineering Services:

- i) 100% payment within 30 days against approval of design drawings.

b) Supply of equipment

- i) 75% payment along with 100% taxes & duties of the supply part shall be paid within 30 days of receipt and acceptance of materials at our site.
- ii) 25% payment of the supply part shall be made within 30 days after successful commissioning and handing over and after submission of performance bank guarantee (PBG) @10% of P.O. value valid till defect liability period.

c) Erection, Testing and Commissioning

- i) 100% payment of Erection & Commissioning Charges shall be paid within 30 days after successful commissioning and handing over.

12. **BASIS OF EVALUATION:** The total lowest cost arrived under price format (4D-d) which will be the landed cost basis and will be considered as the basis for award of contract to the successful bidder

13. **DEVIATION FROM NIT TERMS:** You will forward separate list of deviation with respect to our technical specification as well as commercial terms & conditions point wise and will indicate your conditions against the deviation part.

14. **AFTER SALES SERVICE:** Free of cost for 12 months from the date of commissioning.
15. **SUBMISSION OF OPERATION & MAINTENANCE MANUAL:** Five (5) sets of operations and maintenance manuals to be submitted along with supply.
16. **EARNEST MONEY DEPOSIT (E.M.D):** E.M.D shall be submitted as per our “Instructions to tenderer and general conditions of contract” (Annexed). The E.M.D amount shall be Rs. 1,00,000/- only (Rupees one lakh only). EMD may be in the form of Bank guarantee issued by an Indian Nationalised Bank. *However, NSIC regd. units are exempted from submission of EMD. Parties claiming for exemption shall submit valid NSIC regn. certificate along with the offer.*
17. **SECURITY DEPOSIT:** As per “Instructions to tenderer & general conditions of contract” (Annexure-9). The successful bidder shall furnish a security deposit for 5% of the total value of the order, within 30 days from the date of order.
Further, the bank guarantee shall be as per our proforma enclosed (Annexure-10). It should be automatically extended for validity period in the event of delay in execution of the contract.
18. **BANK GUARANTEE (B.G):**
- Bank guarantees wherever stipulated should be as per our proforma & issued by an Indian scheduled commercial bank.
 - They shall be valid for periods as under.
 - For security bank guarantee: Till satisfactory completion of order.
 - For Warranty: Till end of warranty period.
 - All bank guarantees shall provide for claim period of 6 months after the expiry date.
 - If the bank guarantees are furnished with validity periods less than as stipulated above or in the likelihood of the order not being executed within the stipulated delivery schedule, it will be your responsibility to arrange for extension of the validity of BGs as necessary and furnish the same well in advance of the expiry of the bank guarantee failing which we will be at liberty to invoke the bank guarantee.
19. **DEFECT LIABILITY:** As soon as the work have been completed in accordance with the contract and handed over to UCIL after completion of performance and other tests relevant thereof, UCIL will take over the System from the bidder and will issue a taking over certificate, certifying date on which the works have been completed. The System shall be guaranteed for any defects, malfunctioning, poor performance, non-attainment of capacity, for a period of 12 months from the date of issue of taking over certificate and this shall be backed up by a performance bank guarantee (PBG) @ 10% of the PO value valid till defect liability period as per our proforma enclosed.
20. **AGREED LIQUIDATED DAMAGE:** Time shall be the essence of the contract. If successful tenderer fails to execute the order within the agreed delivery schedule, he shall be liable to pay as agreed liquidated damages a sum @ ½ % of the contract value per week or part thereof of delay subject to a maximum of 5%. In case of delay beyond 10 weeks UCIL reserves the right to cancel the order and levy penalties.
21. **PRE-QUALIFICATION CRITERIA (PQC):**
- Tenders should be either original equipment manufacturer (OEM) of PLC system or should be authorized system integrator of offered make of PLC.
 - Current valid documents / purchase order copy in support of your credentials as PLC manufacturer or system integrator who have done design, engineering, supply, erection & commissioning of minimum 500 l/os PLC system in a process plant.

- c) Purchase order and commissioning certificate of at least one PLC system of Rs. 48 lakhs or two purchase order value of Rs. 30 lakhs each or three purchase order value of Rs. 24 lakhs each in last seven financial years ending 31.03.2013 to be submitted in part-1 of offer.

22. RISK PURCHASE: In the event of order not being executed satisfactorily, we reserve the right to purchase material from alternative sources at your risk and cost.

23. CANCELLATION OF ORDER: It will be your endeavour to execute the purchase order to our satisfaction. In case of your failure to do so, the order is liable to be cancelled.

24. PREFERENCE: Preference will be applicable as per Government of India guideline in vogue.

25. OTHER TERMS & CONDITIONS: In addition to the above terms, other terms & conditions as in the “Instructions to Tenderer and General Conditions of contract” enclosed shall also apply.

26. NOTE TO TENDERERS :

- Income tax shall be deducted as per I.T. Act. Income Tax & Work Contract Tax, if applicable, shall be deducted from your bills
- Supply of the equipment shall be initiated only after getting the site clearance from UCIL.
- The Technical Specification and Performance requirement of plant and equipment shall be as specified in tender specification.
- Machinery shall generally be supplied in fully assembled conditions. In case, it is not feasible to dispatch certain equipment in fully assembled condition, sub-assemblies will be acceptable. However, you should ensure minimum assembly work at site.
- UCIL may supply, **on free of cost basis**, electricity (230V, 1Ph) in controlled quantity for construction, erection and commissioning purposes at one point. You will have to make your own arrangement for distribution/ extension of power line at your own cost.
- You shall submit 03 (three) sets of drawings, documents, data, etc. for approval.

The remark / approval regarding the approval of drawings/documents shall be conveyed by the Purchaser in reasonable time. However, you may have to visit our office at his own cost to explain, Co-ordinate & expedite the approval of his drawings/documents so that the works schedule can be strictly maintained. UCIL may at their discretion decide to approve only General Arrangement (GA) drawings and balance leave to the tenderer.

Upon receipt of prints which shall be marked “Approved” or “Approved except as noted, forward final drawings”, you shall furnish within a reasonable time three (03) additional prints and one (01) reproducible transparency (soft copy) after minor correction, if any, to UCIL.

On completion of erection, testing and commissioning, you shall furnish the “As built drawings”, in numbers as specified above. The “As built drawings” shall be prepared into consideration any changes (as approved by the Engineer) during erection and testing from the approved drawings.

- Erection and commissioning spares to be dispatched along with equipment.
- On arrival of material at site, you shall open the packing, cases and inspect the materials. Repair and replacement of material damaged or lost in transit or at site should be done promptly.
- You shall arrange for all machinery, tools, and tackles derrick etc. as required for handling at site, erection of his machinery under this contract.
- You shall supply, as per the program, three (03) copies of erection, testing, operation and maintenance manuals to UCIL.

- No compensation shall be paid to you for temporary idling of their workers, officers and equipments, etc. for hooking/matching up of the works awarded, with the existing plant's equipment which may arise due to non-availability of site, equipments facilities etc. However best efforts shall be put up by UCIL, without disturbing production of the operating plant, to extend all help and facilities at site to the Contractor for carrying out the works satisfactorily without any loss of time/man/ hour etc.
- You shall submit progress reports to the UCIL stating of design/ drawings procurement, manufacture and delivery functions. In the report, the progress of each activity against the target (based on approved programme) should be highlighted. The progress report should be submitted in the format approved by you.
- During erection, testing and commissioning, you shall be responsible for adequate training of the UCIL personnel so as to enable them to carry out operation and maintenance of the plant machinery under specification.
- Whenever possible all tests shall be carried out before dispatch duly witnessed by the Engineer's representative. Should, however, it becomes necessary to carry out the final tests as to performance and guarantees, the same should be effected after the equipment is erected and commissioned at site and as per agreed procedures and conditions enumerated in the technical specifications. The Engineer shall witness such tests.

Following inspection/tests at site shall be carried out during the course of putting into operation of the machinery to satisfy the guaranteed performance requirement of each equipment/ plant/ system.

- Erection/ alignment checking during erection of individual equipment.
 - Checking of equipment installation with respect to "approved" drawings and document to ensure completeness of erection.
 - Pre-commissioning check-ups as per approved procedure/ documents.
 - Performance guarantee tests/ tests on completion as agreed and decided by the Purchaser.
 - Protective interlock tests for individual equipment.
 - No load run.
 - Sequential run for individual and all circuits/ systems.
 - Load run.
- The sequence of tests of individual equipment shall be mutually agreed to between the Engineer and you.
 - All special apparatus and precision instruments as may be required for the "site tests" shall be arranged by you no extra cost to UCIL.
 - **Reimbursement for variation in Taxes & duties**
The contractor will be paid at actual against production of documentary evidence for any variation in statutory taxes, duties etc. or any imposition of new Governmental taxes / duties during the contract execution etc. period. For this purpose, the bidder indicate clearly in his price bid the details of taxes and duties considered for all those major items for which he intends to claim for such reimbursement.
 - **Schedule of Work**
The successful bidder will have to submit a program of work in the form of Bar Chart and PERT Chart showing the tentative progress of work of design, construction, manufacture, delivery, installation, commissioning etc. within a reasonable time after receipt of LOI but before signing the Contract Agreement, to the Purchaser for his approval. The programme to be made in such a manner that it will cause minimum shutdown of the plant and complete the system within the stipulated time period. The submission to and approved by UCIL of such programme shall not relieve you from any of his duties or responsibilities, under the contract.

- **SERVICE TAX:**

The rate quoted should be inclusive of Service Tax. The tenderer should submit Service Tax registration certificate and number along with the offer.

- **INCOME TAX CLEARANCE CERTIFICATE:**

Tenderers are required to enclose with their tender a latest Income Tax Clearance Certificate in the prescribed form countersigned by the Income-tax Officer of their area under the seal of his Office. In case of partnership, firms, the tenderers shall submit individual Income-tax Clearance Certificate of the partners as well as Income Tax clearance certificate relating to the firm. Tenderers may note that their tenders will not be considered unless they are accompanied by the Income Tax Clearance Certificate as above.

- You shall maintain all safety precautions during execution of work. You should provide your own safety appliances like safety belt, helmet etc. for this work.
- Interim periodical stoppage of work for any reason during the execution for which no any extra claim will be entertained by UCIL.
- **LUMP SUM PRICE** (consisting of Design, Supply and Services including all taxes and duties) **OF PLC SYSTEM QUOTED as per NIT PRICE FORMAT**
- **LABOUR LICENCES & PROVIDENT FUND:**
- The contractor shall at his expenses, ensure due compliance with all applicable and governing industrial and labor laws, rules and regulations and bylaws both of the Central and State Governments and all other local authorities and shall keep the owner harmless and indemnified in respect thereof. The CONTRACTOR shall in particular ensure due compliance with the provisions of relevant Minimum Wages Act, 1948, payment of Wages Act, 1930, Contract Labor (Regulation & Abolitions Act 1970, Employees Provident Fund and Miscellaneous Provision Act 1952 and other Industrial Laws in force at site of work.
- UCIL will not provide any accommodation to the staff of the successful bidder for this job.
- **Medical Care**

The bidder shall be fully responsible for first aid and emergency medical treatment to his employee at site. The bidder at site shall make necessary arrangement for this purpose. In serious cases, medical facilities of UCIL may be available to the Contractor on chargeable basis.

The medical supervision of bidder over his employee shall include anti-malaria measures, vaccination against small pox, and inoculations against cholera, typhoid and other infectious diseases. Employees suffering from infectious disease shall be removed as soon as detected. If any case of infectious disease be discovered amongst the employees, it must at once be reported to the Engineer. The bidder shall abide by the provisions of the Employees State Insurance Scheme as applicable.

DEVIATIONS

The tenderer shall furnish an exhaustive list of deviations, if there any, in his proposal. Tender not complying with tender specifications are liable to be summarily rejected. In case, such deviations/ exceptions are a must for the benefit of the plant, Tenderer shall refer precisely to which part of the tender specification the exceptions or deviations are being made.

No exceptions/ deviations to the tender specification shall be recognized unless expressly mentioned by the bidders.

If no exceptions or deviations are proposed by the tenderer, it shall be so stated clearly.

Tenderer shall also indicate herein whether he would agree to withdraw the deviations if insisted upon by purchaser and whether such withdrawal would be at extra cost / no extra cost to purchaser.

PRICE FORMAT – 4 A

(A) PRICE FORMAT OF DESIGN ENGINEERING

| Sl. No. | Description | Qty. | Price | Service Tax (Rs.) if any | Any other Taxes & Duties (Pl. specify) | Total Cost (Rs.) |
|---------|--|-------|-------|-----------------------------|---|------------------|
| | | 1 | 2 | 3 | 4 | 5 = 1X(2+3+4) |
| 1 | Design Engineering of PLC System for Peroxide Plant | 1 Set | | | | |
| 2 | Design Engineering of PLC System for Magnetite Plant | 1 Set | | | | |

Total (A) =Rs

PRICE FORMAT – 4 B

(B) PRICE FORMAT FOR SUPPLY PART:

1. PLC FOR PEROXIDE PLANT

| Sl. No. | Item Description | Unit | Qty. | Rate Ex Works (Rs.) | Packing & forwarding charges (if any) | Excise Duty (please specify rate in %) | Sales Tax (please specify rate in %) | Any other taxes & duties, if any (please specify) | Freight charges | TOTAL Cost (Rs) |
|---------|--|------|------|---------------------|---------------------------------------|--|--------------------------------------|---|-----------------|-------------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8=1X(2+3+4+5+6+7) |
| 1 | Central Processing Unit (CPU) | Nos. | 2 | | | | | | | |
| 2 | Rack power supply | Nos. | 6 | | | | | | | |
| 3 | 8 slot backplane Rack | Nos. | 2 | | | | | | | |
| 4 | TCP/IP Module | Nos. | 3 | | | | | | | |
| 5 | IO interface card (PLC end) | Nos. | 3 | | | | | | | |
| 6 | I/O interface card (I/O end) | Nos. | 4 | | | | | | | |
| 7 | 32 Ch Digital Input Card | Nos. | 7 | | | | | | | |
| 8 | 32 Ch Digital Output Card | Nos. | 4 | | | | | | | |
| 9 | 16 Ch Analog Input Card (Current & Voltage input universal type) | Nos. | 7 | | | | | | | |
| 10 | 8 Channel RTD Input Card | Nos. | 2 | | | | | | | |
| 11 | 8 Channel Thermocouple Input Card | Nos. | 2 | | | | | | | |

| | | | | | | | | | | |
|----|---|------|----|--|--|--|--|--|--|--|
| 12 | 4 Channel Analog Output Card | Nos. | 4 | | | | | | | |
| 13 | PROFIBUS Interface Card | Nos. | 1 | | | | | | | |
| 14 | MODBUS Interface Card | Nos. | 1 | | | | | | | |
| 15 | 12 Position Ex Rack | Nos. | 3 | | | | | | | |
| 16 | Misc. Hardware (it also includes prefabricated cable from PLC Card to terminal block, ferrule, lugs, mounting base frame, power distribution box, MCB etc.) | Nos. | 1 | | | | | | | |
| 17 | HMI software for 1500 Tags (server version) | Nos. | 2 | | | | | | | |
| 18 | Programming License for Engg Station | Lot | 1 | | | | | | | |
| 19 | Operator console with 40" Monitor | Set | 1 | | | | | | | |
| 20 | Operator console with 19" Monitor | Set | 1 | | | | | | | |
| 21 | Industrial Grade Ethernet switch | Set | 3 | | | | | | | |
| 22 | Engineering station | Set | 1 | | | | | | | |
| 23 | Earthing Material | Set | 1 | | | | | | | |
| 24 | Redundant Power Supply 24 VDC,10A for interrogation and Powering of Transmitters | Lot | 2 | | | | | | | |
| 25 | 8 Channel Relay Board (for Interfacing Digital output) | Nos. | 16 | | | | | | | |
| 26 | 8 Channel Relay Board (for Interlocking in local mode) | Nos. | 2 | | | | | | | |
| 27 | Pre-wired PLC Panel | Lot | 1 | | | | | | | |
| | B1 : TOTAL COST of SUPPLY FOR PLC OF PEROXIDE PLANT | | | | | | | | | |

2. PLC FOR MAGNETITE PLANT

| Sl. No. | Item Description | Unit | Qty. | Rate Ex Works (Rs) | Packing & forwarding charges (if any) | Excise Duty (please specify rate in %) | Sales Tax (please specify rate in %) | Any other taxes & duties, if any (please specify) | Freight charges | TOTAL Cost (Rs) |
|---------|--|------|------|--------------------|---------------------------------------|--|--------------------------------------|---|-----------------|-------------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8=1X(2+3+4+5+6+7) |
| 1 | Central Processing Unit (CPU) | Nos. | 3 | | | | | | | |
| 2 | Rack power supply | Nos. | 6 | | | | | | | |
| 3 | 8 slot backplane Rack | Nos. | 2 | | | | | | | |
| 4 | TCP/IP Module | Nos. | 2 | | | | | | | |
| 5 | IO interface card (PLC end) | Nos. | 3 | | | | | | | |
| 6 | I/O interface card (I/O end) | Nos. | 4 | | | | | | | |
| 7 | 32 Ch Digital Input Card | Nos. | 8 | | | | | | | |
| 8 | 32 Ch Digital Output Card | Nos. | 6 | | | | | | | |
| 9 | 16 Ch Analog Input Card (Current & Voltage input universal type) | Nos. | 7 | | | | | | | |
| 10 | 16 Channel RTD Input Card | Nos. | 4 | | | | | | | |
| 11 | 8 Channel Analog Output Card | Nos. | 4 | | | | | | | |
| 12 | PROFIBUS Interface Card | Nos. | 2 | | | | | | | |
| 13 | MODBUS Interface Card | Nos. | 2 | | | | | | | |

| | | | | | | | | | | |
|----|---|------|----|--|--|--|--|--|--|--|
| 14 | 12 Position Ex Rack | Nos. | 3 | | | | | | | |
| 15 | Misc. Hardware (it also includes prefabricated cable from PLC Card to terminal block, ferrule, lugs, mounting base frame, power distribution box, MCB etc.) | Lot | 1 | | | | | | | |
| 16 | HMI software for 1500 Tags (server version) | Set | 2 | | | | | | | |
| 17 | Programming License for Engg Station | Set | 1 | | | | | | | |
| 18 | Operator console with 40" Monitor | Set | 1 | | | | | | | |
| 19 | Operator console with 19" Monitor | Set | 1 | | | | | | | |
| 20 | Industrial Grade Ethernet switch | No. | 2 | | | | | | | |
| 21 | Engineering station (Spec. as per operator console with 19" Monitor) | Set | 1 | | | | | | | |
| 22 | Earthing Material | Lot | 1 | | | | | | | |
| 23 | Redundant Power Supply 24 VDC,10A for interrogation and Powering of Transmitters | Nos. | 3 | | | | | | | |
| 24 | 8 Channel Relay Board (for Interfacing Digital output) | Nos. | 21 | | | | | | | |
| 25 | 8 Channel Relay Board (for Interlocking in local mode) | Lot | 3 | | | | | | | |
| 26 | Pre-wired PLC Panel | Lot | 1 | | | | | | | |
| | B2 : TOTAL COST of SUPPLY FOR PLC OF MAGNETITE PLANT | | | | | | | | | |
| | TOTAL COST of SUPPLY FOR PLC SYSTEM (B=B1+B2)= Rs. | | | | | | | | | |

PRICE FORMAT – 4 C

(C) PRICE FORMAT OF ERRECTION & COMMISSIONING

| Sl. No. | Description | Qty. | Price | Service Tax (Rs.), if any | Any other Taxes & Duties (Pl. specify) | Total Cost (Rs.) |
|---------|---|-------|-------|------------------------------|---|------------------|
| | | 1 | 2 | 3 | 4 | 5 = 1X(2+3+4) |
| 1 | Errection and Commissioning of the PLC System of Peroxide Plant | 1 Set | | | | |
| 2 | Errection and Commissioning of the PLC System of Magnetite Plant | 1 Set | | | | |

Total (C) =

PRICE FORMAT -4D

| SL.NO. | DESCRIPTION | TOTAL AMOUNT (Rs.) |
|--------|--|--------------------|
| a | PRICE FORMAT OF DESIGN ENGINEERING (Price format – 4A) | |
| b | PRICE FORMAT FOR SUPPLY PART (Price format – 4B) | |
| c | PRICE FORMAT OF ERRECTION & COMMISSIONING (Price format – 4C) | |
| d | GRAND TOTAL (in figure and word) | |

INSTRUCTIONS TO TENDERER AND GENERAL CONDITIONS OF CONTRACT

Tenderers are required to give their sealed Tender in duplicate.

No Tender shall be considered if:

- a) Tenders are received after the specified date and time.
- b) The quotations are not legible and contain overwriting.
- c) Prices are tendered telegraphically on the due date and not confirmed subsequently.
- d) All the pages of offer are not signed by competent and authorised persons. Any person given a tender shall furnish documentary evidence that his signature on the tender, submitted by him is legally binding upon himself, his firm or company as the case may be.

Prices: The prices quoted must be net per unit quantity. Sales tax/Excise duty, packing and delivery charge if applicable should be shown separately. Wherever necessary the prices may be shown separately if the material or part is imported.

Prices shall be given as under:

- a) F.O.R. destination (Jaduguda / Narwapahar / Turamdih) by road.
- b) If the item is imported, break up shall be furnished indicating:
 - i) F.O.B. port of shipment in foreign currency.
 - ii) Insurance & freight up to Calcutta Port.
 - iii) Foreign Exchange rate.
 - iv) Customs tariff heading and custom's duty.
 - v) Clearance & charges for delivery at Jaduguda.

Acceptance of Tender: The final acceptance of the tender rests with UCIL, who reserves to itself the right to reject any or all tenders without assigning any reason. It does not bind itself to accept the lowest or the whole of a tender. Order may be placed on more than one tenderer.

Validity: The prices should remain firm for acceptance for 180 days from the date of opening of the tender.

Responsibility of Completeness: Goods quoted for must be complete in all respect. Any fittings or accessories which may not be specifically mentioned in the specification but which are usual or necessary are to be provided by the Tenderer without extra charges.

Quantity: The Corporation reserves the right to order less or more than the specified quantity at the offered rates.

Insurance: Transit insurance should cover all risks upto the destination. Insurance will be arranged by the Corporation or the supplier depending on the basis of the contract.

Earnest Money: Offers should be accompanied by an earnest money deposit, without which, the offer is liable to be rejected.

The amount of the EMD shall be as stipulated under "SPECIFIC TERMS & CONDITIONS FOR SUBMITTING OFFER".

E.M.D. shall be in the form of a demand draft drawn on State Bank of India, Jaduguda Branch (code No. 0227) or Jamshedpur Branch of any Indian Nationalised bank drawn in favour of URANIUM CORPORATION OF INDIA LTD. EMD may be by way of a bank guarantee issued by any Indian Nationalised Bank. E.M.D. shall not bear any interest.

Security Deposit: The successful bidder shall furnish a security deposit to the extent of 5% of the total value of the order, before the order is awarded. Such a deposit will be held by the Corporation until successful completion of the order/contract, and will bear no interest. It will be forfeited in the event of breach of contract. Security deposit may be in the form of a bank guarantee issued by/ counter guaranteed by an Indian Nationalised bank in favour of URANIUM CORPORATION OF INDIA LTD.

Inspection: UCIL reserves the right of stage and/or pre-dispatch inspection for which due notice shall be given by the supplier. However, final inspection shall be done on receipt of goods at destination.

Capability: List of customers of repute with Photostat copies of order may be submitted along with your offer.

Rejection of Goods: UCIL reserves the right to reject goods which are not as per specification and also if supplied in breach of the terms & conditions stipulated. In case of rejection you shall have to replace free of cost or refund the amount paid.

UCIL shall be entitled to recover from the supplier costs incurred by UCIL in respect of the rejected goods. Rejected goods will be lying at the UCIL's store at the supplier's risk and shall be removed by the supplier at his own cost immediately on receipt of rejected advice. The Corporation will not be responsible for any loss on account of deterioration etc. of the rejection goods. If rejected goods are not removed by the supplier, UCIL may charge penal rent and dispose off the goods as deemed.

Failure and Termination of Contract: When once the tender is opened, the tenderer is bound to abide by the rate, delivery and other terms & condition quoted by him. For any default in this connection or withdrawal of the quotation, the earnest money deposit shall be forfeited. If the tenderer fails to deliver any stores in accordance with to the terms & conditions, as per specifications stipulated, replace any stores rejected within such time as may be stipulated or breach of contract in any other way, the Corporation shall be entitled to anyone or more of the following:

- a) Cancel the contract, wholly or partly.
- b) Forfeit the earnest money and/or security deposit
- c) Impose penalty ranging from 3% to 10% of the contract value.
- d) To Procure from alternative sources and recover extra cost incurred by the Corporation.
- e) Removal of supplier's name from the approved list of suppliers.
- f) To receive from the tenderer as agreed liquidated damages a sum equal to half a percent of the value of the stores which the tenderer fails to deliver per each week or part thereof during which the delivery of such stores may be in arrears.
- g) Recovery of Liquidated damages.

In the event of action taken under clause (d) and (f) above, the tenderer shall be liable for any loss which the Corporation (UCIL) may sustain on that account but the tenderer shall not be entitled to any saving on such purchases made against default.

The decision of the Corporation (UCIL) shall be final as regards the

- acceptability of stores supplied by the tenderer and the Corporation.
- shall not be required to give any reason in writing or otherwise at
- any time for the rejection of the Stores.

Warranty Clause: The tender shall declare that the goods/stores/articles sold to the Corporation, (UCIL) under contract shall be of the best quality, workmanship and shall be strictly in accordance with the specifications and duty parameters contained in the contract. The corporation reserves the right to call for a performance guarantee backed by a bank guarantee. Notwithstanding the fact that the Corporation (UCIL), or any person on its behalf, may have inspected and/or approved the said goods/stores/articles, if it be discovered not to conform to the description and quality aforesaid or deteriorated goods may be rejected. On such rejection all the provisions relating to 'Rejection of goods' shall apply. The tenderer shall, if so called upon, replace the good, or such portion thereof as is rejected by the Corporation and compensate such damages as may arise by reason of the break of the condition here in contained. Nothing, here in contained shall prejudice any other right of the corporation (UCIL) in that behalf under a contract or otherwise.

Payment terms: Unless otherwise agreed to, payment will be made within 30 days of receipt and acceptance of goods.

Force Majeure: In the case of strikes/lockouts, closure of works (whole or partial) breakdown of machinery, act of God or any other cause beyond the control of the Corporation preventing or hindering the normal operation, the Corporation shall be at liberty to cancel this order at any time before receipt of the goods without being liable to the supplier for damages or other claims.

Disputes: Both parties agree in, disputes arising out of this order may be settled by arbitration, in accordance with the Indian arbitration Act, 1940 by a sole arbitrator who shall be appointed by the Chairman & Managing Director of this Corporation (UCIL).

Jurisdiction: This agreement/order shall be deemed to have been executed at Jaduguda, District Singhbhum (East), Jharkhand and it is subject to the jurisdiction of the court of Law in Ghatsila only irrespective of anything to the contrary that may be mentioned in the offer of the tenderer.

PROFORMA FOR BANK GUARANTEE AGAINST SECURITY DEPOSIT

TO

URANIUM CORPORATION OF INDIA LIMITED
P.O. JADUGUDA MINES,
DIST: EAST SINGHBHUM (JHARKHAND)
PIN : 832102

Sir,

WHEREAS on or about the _____ day of _____ M/s (Supplier's name & address), a Company / Firm registered under (companies Act 1956/.....) and having its registered office situated at (Postal address) (herein after referred to as 'The Supplier') entered into a contract bearing reference no. _____ dtd. _____ with Uranium corporation of India Limited., (A Govt. of India Enterprises), P.O. Jaduguda Mines, Dist: Singhbhum East, Jharkhand – 832102 (herein after referred to as UCIL) for supply (details of order) (herein after referred to as 'The Contract').

AND WHEREAS under the terms and conditions of the contract the supplier is required to keep with UCIL a security deposit of Rs. _____ (Rupees _____ only) or submit a Bank Guarantee in lieu of cash deposit for the fulfillment of the terms and conditions of the contract, and whereas the supplier has chosen to submit a Bank Guarantee.

NOW WE (Bankers) hereby agree and undertake to indemnify UCIL and keep UCIL indemnified to the extent of a sum not exceeding the sum of Rs. _____ (Rupees _____) against any damage or loss that may be suffered by UCIL by reason of non-fulfillment of any of the terms and conditions of the contract by the supplier.

AND WE, (Bankers) hereby undertake to pay on demand in writing by UCIL or any officer of UCIL within 48 hours and without any demur to UCIL on behalf of the supplier any sum of sums not exceeding in the total Rs. _____ (Rupees _____) as may be claimed by UCIL as the damages or loss that UCIL may have suffered by reasons of the non-fulfillment of any particular terms and conditions of the contract by the supplier.

We undertake to pay to you any money so demanded notwithstanding any dispute or disputes raised by the supplier in any suit or proceeding pending before any court or tribunal or arbitrators relating thereto.

AND WE, (Bankers) hereby further agree that the decision of UCIL as to whether the supplier has committed breach of any such terms & conditions of the contract or not and assessment of UCIL as to the amount of damages or loss suffered by UCIL on account of such breach would be final and binding on us and it need not be established.

AND WE, (Bankers) lastly agree that our liability hereunder shall not be discharged by virtue of agreements between UCIL and the supplier whether with or without our knowledge, and / or consent or by reason of UCIL showing any indulgence or forbearance to the supplier whether as to payment, time, performance or any other

matter whatsoever or any modification of the said contract which but for this provision would amount to discharge of the surety under the law.

This guarantee shall not be revoked by us whether before its coming into force or any time during its currency without your previous consent in writing.

AND WE, (Bankers) also agree that our liability hereunder shall not be discharged by any change in the constitution of this bank or the firm of supplier. Our liability under the guarantee shall not in any event whatsoever exceed the sum of Rs. _____ (Rupees _____).

Our guarantee shall remain in force until (date) or such further date up to which this bank guarantee is renewed or extended and unless a claim under the guarantee is lodged with us within 6 (six) months from such date all rights of UCIL under the guarantee shall be forfeited and we shall be relieved and discharge from all liabilities thereunder.

For the purpose of enforcing legal rights / remedies under this guarantee we agree that the court of law of GHATSILA, Singhbhum East, Jharkhand State shall have exclusive jurisdiction.

We have power to issue this guarantee and the undersigned has full power to sign this guarantee on our behalf under POWER OF ATTORNEY granted to him by the Bank.

Dated at (Place) this _____ day of _____ 201_____

For (BANKER'S NAME)

Signature

(Name in Capital letter)
Designation _____

Signature

(Name in Capital letter)
Designation _____

NOTE TO SUPPLIERS :

- i) BANK GUARANTEE submitted by you should be sent to us directly by the issuing bank under Registered Post (A.D).

NOTE TO ISSUING BANK :

- i) In case you desire to submit the BANK GUARANTEE directly to us, you are requested to send by Registered Post (A.D) an unstamped duplicate copy of the guarantee directly to us with a covering letter to compare with the original BGs and confirm that it is in order.

PROFORMA FOR BANK GUARANTEE AGAINST WARRANTY

TO

URANIUM CORPORATION OF INDIA LIMITED
P.O. JADUGUDA MINES,
DIST: EAST SINGHBHUM (JHARKHAND)
PIN : 832102

Sir,

WHEREAS M/s (Name and full address) (hereinafter referred to as the 'contractor' received an order bearing reference number _____ dated _____ (hereinafter referred to as the 'Contract') from Uranium Corporation of India Limited, P.O. Jaduguda Mines, District: Singhbhum, Jharkhand – 832102 (hereinafter referred to as 'UCIL') for the supply of _____.

And whereas the contractor is required to guarantee that the goods supplied is free from defects in its material of construction workmanship and its performance and further required to rectify by repair or replacement free of all costs to UCIL any defect / defects in the goods and / or its performance, if noticed within the warranty period stipulated.

And whereas UCIL has agreed to pay the contractor the full value (inclusive of duties and taxes) of the goods supplied on the contractor furnishing a bank guarantee in the manner here in contained for a sum of Rs. _____ (Rupees _____) to cover the said guarantee.

Now we (the Banker) hereby agree and undertake to indemnify UCIL and keep UCIL indemnified to the extent of a sum not exceeding the sum of Rs. _____ (Rupees _____) against any damage or loss that may be suffered by UCIL by reason of non-fulfillment of the obligations under the said guarantee by the contractor.

AND WE, (Banker) hereby undertake to pay on demand in writing by UCIL or any officer of UCIL within 48 hours and without any demur to UCIL on behalf of the supplier any sum or sums not exceeding in the total Rs. _____ (Rupees _____) as may be claimed by UCIL as the damages or loss that UCIL may have suffered by reasons of the non-fulfillment of any particular terms and conditions of the contract by the suppliers.

We undertake to pay to you any money so demanded notwithstanding any dispute or disputes raised by the supplier(s) in any suit or proceeding pending before any court or Tribunal or arbitrators relating thereto.

AND WE (Bankers) hereby further agree that the decision of UCIL as to whether the contractor has committed breach of any such terms and conditions of the contract or not and assessment of UCIL as to the amount of damages or loss suffered by UCIL on account of such breach would be final and binding on us and it need not be established.

AND WE, (Bankers) lastly agree that our liability hereunder shall not be discharged by virtue of arrangements between UCIL and the supplier whether with or without our knowledge, and / or consent or by reason of UCIL showing any indulgence or forbearance to the supplier whether as to payment, time, performance or any other

matter whatsoever or any modification of the said contract which but for this provision would amount to discharge of the surety under the law.

This guarantee shall come into force simultaneously with your making the payment to the supplier and shall not be revoked by us whether before its coming into force or any time during its currency without your previous consent in writing.

AND WE, (Bankers) also agree that our liability hereunder shall not be discharged by any change in the constitution of this bank or the firm of supplier. Our liability under the guarantee shall not in any event whatsoever exceed the sum of Rs. _____ (Rupees _____).

Our guarantee shall remain in force until _____ (date) _____ or such further date up to which this bank guarantee is renewed and unless a claim under the guarantee is lodged with us within 6 (six) months from such date, all rights of UCIL under the guarantee shall be forfeited and we shall be relieved and discharge from all liabilities thereunder.

For the purpose of enforcing legal rights / remedies under this guarantee we agree that the court of law of GHATSILA, Singhbhum East, Jharkhand State shall have exclusive jurisdiction.

We have power to issue this guarantee and the undersigned has full power to sign this guarantee on our behalf under POWER OF ATTORNEY granted to him by the Bank.

Dated at (Place) this _____ day of _____ 201__

For (BANKER'S NAME)

Signature

(Name in Capital letter)
Designation _____

Signature

(Name in Capital letter)
Designation _____