



ELIGIBILITY CRITERIA FOR SUPPLY & ERECTION / COMMISSIONING OF INTEGRATED TURBINE & COMPRESSOR CONTROL FOR 11 & 21 COMPRESSORS IN UREA-I

Sr. No.	Conditions	Documents Required
1	Bidder on its own or through its original equipment manufacturer (OEM) should have experience of similar work in any Fertilizer/ Petro-chemical/ Oil & Gas Industries/ Refineries industry, during last five years ending last day of the month previous to which NIT has been issued.	<p>i. OEM authorization certificate specific to this tender, if bid is submitted by Authorised Dealer/Channel Partner to be submitted. In case of OEM self-certification on their letter head to be submitted.</p> <p>ii. Copies of Purchase order shall be submitted, at least one reference in India.</p>
2	<p>Bidder on its own or through its original equipment manufacturer (OEM) should have experience of similar work in any Fertilizer/ Petro-chemical/ Oil & Gas Industries/ Refineries industry, during last five years in India, ending last day of the month previous to which NIT has been issued.</p> <p>Similar work means "Supply and Erection / Commissioning of Integrated Turbine & Compressor Control system (ITCC) in Centrifugal Turbine Compressor train of minimum 7 MW".</p> <p>Performance/ Completion certificate</p>	<p>i. List of customers (with Make & Model no.) to whom Integrated Turbine & Compressor Control system (ITCC) has been supplied and commissioned, at least one reference in India shall be submitted.</p> <p>ii. Minimum one copy of Purchase order with technical & commercial details including P.O. value for Similar work as per condition 2 shall be submitted.</p> <p>The Bidder on its own or through its original equipment manufacturer (OEM) should submit Performance/ Completion certificate, against above PO indicating PO details, PO value, executed value, date of completion and should be issued by organization/ end user where similar work is executed.</p>
3	The Average Annual financial turnover of the Bidder during the last three financial years ending 31 st March 2023 should at least Rs. 133.50 Lakhs per annum for which vendor shall submit the certified copies of Audited Balance sheet and Profit & Loss statement for the last three financial years ending on 31 st March of 2023.	<p>Bidder shall submit financial standing through Audited Balance sheet and Profit & Loss statement for last three financial years ending on 31st March of 2023 (i.e. FY 2020-21, 2021-22, 2022-23).</p> <p>In case the bidders do not fall under the ambit of statutory audit and do not have Audited Annual reports/Audited Balance sheets and Profit & Loss statements, the bidder shall submit a statement certified by Statutory Auditor/ Practicing Chartered Accountant having UDIN no. as documentary evidence in support thereof.</p>

Note:

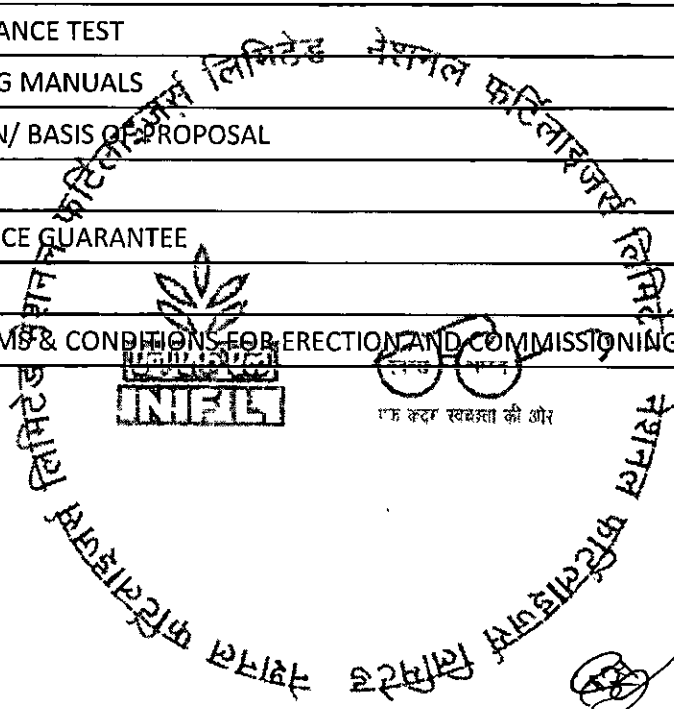
- In case Performance/ Completion certificate from concerned organization / end user is not available, then bidder to submit self-certification for the same on their letter head mentioning name and address of the organization/end user, contact person name and contact detail including email etc. Month/year of installation with PO number & value, certifying the performance. Decision of acceptance of Bid shall be final and binding to the vendor.
- All the required documents shall be self-attested by the bidder.

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SPECIFICATIONS FOR INTEGRATED TURBINE AND COMPRESSOR CONTROL SYSTEM (ITCC)

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SPECIFICATIONS FOR INTEGRATED TURBINE AND COMPRESSOR CONTROL SYSTEM (ITCC)

1. PREAMBLE

1.1. Description Of Existing Plants

National Fertilizers Limited, a Schedule 'A' & a Mini Ratna (Category-I) Company. National Fertilizers Ltd, Vijaipur unit situated in Guna District, Madhya Pradesh is one of the four units of M/s NFL. NFL Vijaipur unit is having two numbers turbine driven, rotary Co2 compressors in Line-I Urea plant. Line-I is commissioned in the year 1987.

With reference to below data the governing system of Steam turbine to be revamped from Woodward PGPL governor to ITCC system.

Detail of Driver

Turbine Make : BHEL TURBINE
Type/Model No. : K1000 GE-2
Machine Serial No. : T-0292 & T-0293

Details of Governor

Make : M/s. Woodward
Governor Type : PG-PL
Governor Serial No. : 2089492
Governor Part No.: T8557-305
Governor Drive shaft Speed : 638 RPM - 893 RPM
Minimum Governing Speed: 6279 RPM
Maximum Continuous Speed: 8662 RPM
Normal Running Speed: 8300 RPM to 8400 RPM
Control Air Pressure: 0.2- 1.0 Kg/Cm²

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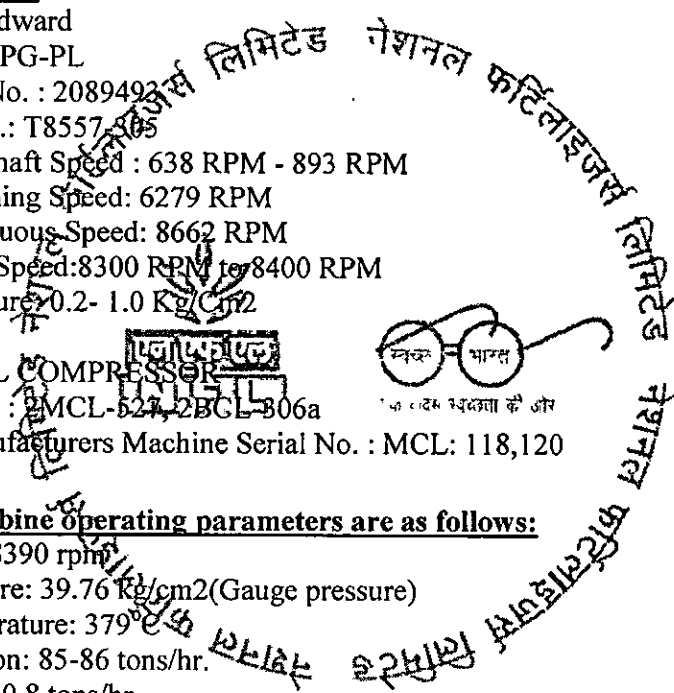
Make: :M/s BHEL COMPRESSOR
Type/Model No. : : BMCL-524, 2BCL-306a
Compressor Manufacturers Machine Serial No. : MCL: 118,120
BCL: 117,119

Our present Turbine operating parameters are as follows:

RPM of turbine: 8390 rpm
Inlet steam pressure: 39.76 Kg/cm²(Gauge pressure)
Inlet steam temperature: 379°C
Steam consumption: 85-86 tons/hr.
Extraction flow: 50.8 tons/hr.
Extraction steam pressure: 22.52 kg/cm²(Gauge pressure)
Extraction steam temperature: 327.1°C
Exhaust Pressure: -0.812 kg/cm²(Gauge Pressure)
Exhaust temperature: 54.

1.2. SITE CLIMATIC CONDITIONS:

Atmospheric Pressure (mbar) Max/Min: 967.9/936.1
Air Temperature (°C) Max/Min: 46.2/(-)2.2
Wind velocity (m/sec): 9.0
Mean Annual rainfall (mm): 1219.8
Operating Temperature: 0°C to 65°C
Humidity: 0% to 95% Non-Condensing



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- 1.3. Upgradation to ITCC system (Scope of work) for 2 Nos of BHEL Machines 11-TK-1 & 21-TK-1.** Upgradation to ITCC system of each BHEL Machines includes:
- Supply of complete ITCC governor system.
 - Supply of electronic over-speed protection system (OSPS).
 - Supply of electro-hydraulic actuators for HP valve.
 - Supply of I/H converter for LP Valve.
 - Removal of existing PGPL governor.
 - Installation and commissioning of ITCC governor system including retrofitting (if any).
 - Supply of engineering and commissioning spares.
 - Supply of cables, transmitters, piping and tubing shall be in the scope of bidder.

2. DETAILED SCOPE:

- 2.1. This Specification defines the requirement of Integrated Turbine and Compressor Control System (ITCC) and Electronic overspeed protection system (OSPS) for steam turbine driven compressor. The scope of bidder shall include Design, Engineering, Testing (FAT), Supply, SAT, Training, Removal of old system, Installation and Commissioning of the new system including retrofitting (if any).
- 2.2. The ITCC shall comprise of the following control applications / programs:
- Steam Turbine Governing (speed and extraction) control.
 - Compressor control like antisurge & performance control etc.
 - One Engineering (EWS) and Three Operator workstations (OWS) with minimum 22" monitor with A4 laser printer.
 - Supply of cables from field to ITCC shall be in the scope of bidder.
- 2.3. Removal of existing PGPL governor system as per requirement to install new ITCC system shall be in the scope of Bidder.
- 2.4. Steam Turbine overspeed protection system (OSPS) shall be independent of ITCC hardware.
- 2.5. It is the responsibility of the vendor for engineering of the complete ITCC & OSPS package along with detailed Bill of material.
- 2.6. It is emphasized that this document provides the minimum requirements and does not relieve the Supplier from his responsibility concerning the engineering, supply, erection, reliability, maintainability, safe and successful operation of the complete system.

3. TECHNICAL REQUIREMENTS:

3.1. INTEGRATED TURBINE AND COMPRESSOR CONTROL SYSTEM (ITCC):

- The ITCC hardware shall be with DMR. The redundancy shall be on electronic module (CPU, IO, Communication etc.) level and power supply level.
- ITCC cards shall be Hot swappable type i.e. it shall be possible to program, re-program, remove from rack and insert into rack without system shutdown. The ITCC electronic cards including CPU, IO, Communication, Power Supply shall be on-line configurable and on-line repairable.
- Complete ITCC hardware shall be SIL-3 certified.
- The ITCC loop scan / response time (total time to read input, processing time and output) shall be as per the machine dynamics and safety and shall be maximum 40 milliseconds. Any faster response required based on machine dynamics shall be considered by vendor. The input sampling interval shall be as per machine dynamics within the controller response time as above. The processor cycle time shall be considered to meet the overall response time.

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- v. Distance between 11-K-1 to CCR is 450 meters and 21-K-1 to CCR is 550 meters for cable laying from field instruments to ITCC panel.
- vi. ITCC panel shall be located in Central Control room and the following operator interfaces shall be considered.
 - a. One Engineering workstation (EWS) & One Operator workstation (OWS) shall be placed in Central Control room for both ITCC systems.
 - b. Two OWS (each for 11 and 21 section) shall be placed in 11 & 21 section compressor control rooms.
 - c. The workstation shall be used as engineering, configuration and operator station, accordingly development, logic modification and run time licensed software's shall be provided. Either Dell/HP make PC shall be considered for EWS and OWS.

The workstation shall be used for following functions:

1. Programming, Engineering and configuration of ITCC.
 2. Loading / Unloading / backup of ITCC program.
 3. HMI Graphic Screens development and modification.
 4. Trends and Alarm Historian .
 5. Capability to transfer / export trends, Historian data to MS Excel.
- d. The software licenses shall not be time bound or limited to specific period of use (like valid for 1 year etc.). The software license shall not expire after a certain period.
 - e. The HMI Workstation shall be supplied with Licensed antivirus software.
 - f. The complete software backup image of As-Shipped workstation shall be supplied in a USB.
 - g. A second software backup image of the As-Commissioned HMI workstation shall be created after commissioning and a copy of the same shall be submitted..
 - h. Vendor to supply program loads (laptop specified in RFQ) along with necessary maintenance software's (licensed software's) for application program engineering, modification, uploading/ unloading in the ITCC.
 - i. Connecting cable to ITCC & OSPS system for programming and software loading shall be provided. Licensed version of latest antivirus shall be provided in all Laptops and EWS & OWS workstation. The Antivirus shall be activated during commissioning.
 - j. Vendor shall supply two licensed copies of all ITCC & OSPS software in CD / DVD / USB with passwords / keys to access the software.
 - k. The ITCC program / configuration shall be stored in non-volatile memory or battery back-up for configuration shall be provided (minimum 72 hours) in case of volatile memory along with battery drain indication
 - l. All stations shall be supplied with consoles.

vii. Barriers and Terminal Blocks : All field inputs shall be connected to ITCC hardware through barrier and supply of barriers for all the inputs shall be in the scope of vendor. AI barriers shall be splitter type i.e 1 input and 2 similar outputs (1st o/p for ITCC and 2nd o/p for DCS). Either P&F or MTL make barriers shall be used. All terminal blocks used in the panels shall be of Wago/Weid Mueller/Phoenix make screwed, side/side entry type suitable for 0.5 sq.mm to 4.0sq.mm and DIN rail mounted. No double Decker terminal blocks are permissible. 20% extra barriers and TB's of each category shall be installed and wired with respective modules for future use.

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viii. The steam turbine governing (Governor) application in ITCC shall have following minimum features:

- a) The Governor shall be API 670 & 612 compliant.
- b) Governor shall accept input from 2 speed sensors.
- c) It shall be possible to program the governor to operate the steam turbine from zero speed to rated speed with ramp rates, idle speeds, critical speeds for Hot, Cold and Warm conditions as per the startup curves.
- d) The governing valve characteristics shall be programmed in the governor for linearization.
- e) The governor shall be capable of operating in Auto, semi auto and manual modes.
- f) The governor shall accept external 4-20 mA signal from DCS or Local as a manual speed / load setpoint to governor. The governor shall have bumpless transfer for auto / manual selection or local / remote selection. The auto/manual selection and local/ remote selection facility shall be configured in governor and available on the HMI.
- g) HMI shall include features like assignable speed range, adjustable speed set point, remote speed set point input, digital speed indication, adjustable speed ramp, override for testing the external Overspeed trip system etc.

ix. Project Specific data like Process P&ID, Isometrics, Instrument datasheets shall be provided during detail engineering; however, the number of Compressor Control applications / controllers shall be as specified in Enquiry

x. The compressor control application inside ITCC shall have following minimum features:

- a) Compressor Control means Compressor Antisurge Performance etc.
- b) Each antisurge control application shall have minimum six analog inputs. The output shall be to existing single antisurge control valve.
- c) In addition to above, there shall be provision for manual override (open command) to ASC (Anti surge control) valve through 4-20 mA signal from DCS.
- d) Sufficient number of digital IO shall be considered for transmitter fault, trip, load, unload, run & stop etc.
- e) Vendor shall design the antisurge algorithm such that it is immune to changes in gas properties (like change in mol. Weight, pressure, temperature etc.)
- f) The input and output IOs for Performance shall be decided as per the project requirements.
- g) There shall be provision for giving external control setpoints from DCS for performance control. Vendor to indicate and include the same.
- h) Party may check the available parameters for implementation of Antisurge control system. Additional parameters requirement shall be fulfilled by vendor like piping, transmitters and cables etc.

3.2.ELECTRONIC OVERSPEED PROTECTION SYSTEM (OSPS):

- i. The OSPS shall be API 670 & 612 compliant and SIL-3 certified.
- ii. Electronic over speed protection system comprises of speed sensors and logic devices to provide 2oo3 voting configuration.
- iii. The OSPS shall accept input from 3 speed sensors and shall be independent of speed sensors of governing ITCC system.
- iv. The OSPS shall be installed in the ITCC panel and shall be independent of the ITCC hardware.
- v. The OSPS shall have online testing and fully redundant power supplies.
- vi. The OSPS shall sense an Overspeed event and change the state of its output relays within 40 milliseconds maximum.
- vii. Program loader laptop/workstation shall be loaded with software for program loading / unloading and settings configuration of OSPS.

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3.3. HP & LP VALVES

The existing HP valve actuator shall be replaced with new electro-hydraulic actuator. The actuator shall be linear electro-hydraulic actuator with integrated electronic driver module, servo valve and redundant position feedback sensors to precisely control steam turbine valves. The actuator's driver module accepts 4-20 mA demand setpoints to accurately control output shaft position. Supply of electro-hydraulic actuators for HP Valve is in the scope of bidder.

The existing LP valve actuator shall be retained. The party shall provide I/H (Current-to-Pressure Converter) for positioning LP valve and its associated servo system. The I/H shall supply a precise and stable hydraulic control pressure proportional to the (4 to 20) mA input current signal.

3.4. CABINET SPECIFICATIONS:

- i. Two nos of cabinets shall be provided, One each for 11 and 21 sections ITCC system.
- ii. Cabinets shall be completely wired with all the modules in place.
- iii. Dimension shall be 1200 mm(W) X 800mm(D) X 2000 mm(H) (Preferably Rittal make).
- iv. Black powder coated 100 mm Base frame shall be provided.
- v. Panel color shall be preferably RAL 7032/7035 shade.
- vi. Free standing, enclosed type, min. 2mm thick good quality steel plates, with channel base.
- vii. The doors, side and back panels shall have 1.6 mm thickness. Cables entry - From the bottom.
- viii. Front door shall be having transparent glass or acrylic sheet, so that status of modules can be visible from outside.
- ix. Cabinet access - From front and rear with locked doors complete with keys.
- x. Safety grounding and signal grounding shall be provided with a grounding strip.
- xi. Terminals- Wago/Weid Mueller/Phoenix.
- xii. Cables fixing through SS cable glands.
- xiii. Forced Ventilation from top of the cabinet is required. Fan failure module shall be required for Fan failure indication.
- xiv. Sufficient clearance for smooth opening and closing the doors shall be provided to avoid touching of any module or cables.
- xv. Service power socket with 230VAC 50 Hz and Internal Light with switch (on/off) shall be provided
- xvi. Incoming and outgoing cables/wires from and to the cabinets shall be terminated at terminals in the cabinets.
- xvii. Cable ducts - Dedicated for power, signal and non-signals. Cable ducts shall be of Plastic with cover (150mm) sized to allow loading coefficient of 80% only.
- xviii. Lifting eye bolts (4 Nos. per cabinet) are required.
- xix. Cutout with removable cable gland plate (for drilling as required) shall be provided.
- xx. Power supply packs shall be positioned so as not to generate electromagnetic interference to the electronic component.
- xxi. All cabinets shall be mounted with anti-vibration pads.

3.5. GENERAL:

- i. ITCC & OSPS electronic modules shall be conformal coated to G3 environment as per ISA
- ii. The analog input and output signals shall be 24VDC, 4-20mA, 2 wire and powered from the ITCC through barriers / isolators.
- iii. The controller shall monitor its output and initiate an alarm if output failure is detected.
- iv. The controller shall be designed with a fail-safe mode to prevent a process upset caused by a transmitter or input failure. The controller vendor shall specify the fail-safe mode required for each specific installation.

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- v. Two feeders of 110Vac 50Hz UPS power supply shall be provided at ITCC panel by the NFL, all other power supplies for ITCC, OSPS, HMI, separate & independent 24VDC power supply for I/H converters. (Redundant), power supply for Laptop, Printer, barriers, isolators etc. shall be generated / provided by the vendor from ITCC panel.
- vi. The workstation, Laptop and printer shall be suitable for power supply range of 90 to 270 Vac 50 Hz. Power cable and other accessories for Laptop and printer shall be supplied by the vendor.
- vii. For Speed measurement, Magnetic Pickups (MPU, Explosion proof type) are required. The same shall be suitable for hazardous area classification for IEC Zone-1 & Zone-2 Group IIC, Temperature class T3.
- viii. All inputs and outputs from hazardous area shall be provided with barriers and from safe area shall be provided with isolators / relays.
- ix. It is vendor's responsibility to supply a system, which functionally meets all the requirements of this specification. Any item not supplied but required to meet the specification requirements, during the execution of the order or during commissioning to meet the proper functioning of the system, shall be supplied by the vendor at no extra delivery and no extra price.
- x. Communication cables shall be supplied with connectors at both ends. Necessary additional modules as required shall be supplied and assembled in the cabinet by the vendor for achieving the dual redundant communication to DCS.
- xi. It shall be possible to operate, program, and diagnose the control system faults from the HMI.
- xii. The IO count includes installed, unused spare IOs. Vendor to note that 20% installed IO shall be left unused after IO allocation. All IOs shall be wired to terminal through barriers / isolators / relays.
- xiii. ITCC shall be supplied in fully assembled, wired and factory tested panel.

3.6. INSPECTION & TESTING:

- i. Bidder to furnish the QA plan & FAT procedure along with the data sheets of all the equipment in line for approval after placement of order.
- ii. The controllers / fully assembled system (if applicable) shall be tested in an integral manner by simulation. Customer representatives shall inspect the system at supplier works during factory acceptance test (FAT). Boarding and Lodging will be in bidders scope.

3.7. COMMUNICATIONS:

- i. Communication with DCS: ITCC shall be interfaced with the customer's DCS via RS485 Modbus RTU or Modbus TCP . Vendor shall ensure that each controller shall be provided with TWO number of communication ports for above.
- ii. Communication with EWS/OWS HMI workstation: Redundant communication ports, preferably ethernet shall be provided on ITCC. Vendor shall provide all communication hardware & software and other networking accessories like redundant Ethernet Switch for redundant communication network.
- iii. If the cable distance between ITCC and workstation is very large, communication shall be on fiber optic network. Vendor shall provide two sets of DIN rail mount type redundant Fiber Optic Converters with LIU and patch cords along with redundant power supply.
- iv. Ethernet cables from FOC to ITCC / FOC to workstation shall be supplied by vendor.
- v. Electronic OSPS shall be interfaced with the customer's DCS via dual redundant RS485 Modbus RTU or Modbus TCP.
- vi. Vendor shall furnish the communication network schematic indicating all the hardware components along with the offer.

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4. SYSTEM ENGINEERING

- 4.1. The control system shall be designed to meet the customer specifications. This includes generation of the controller wiring drawings and control system diagrams, the development and implementation of the control logic with initial controller configuration.
- 4.2. Transmitters, flow measuring devices and antisurge valves associated with Antisurge control and Performance etc. are to be evaluated for proper location and sizing.
- 4.3. The system engineering service shall include the following for each compressor control application, but not limited to the following:
 - i. Preparation of Design Specifications.
 - ii. Compressor Maps to be analyzed.
 - iii. Flow Measuring Device Calculations
 - iv. Controller Configuration.
 - v. Transmitter Range Specification
 - vi. Preparation of Drawings.
 - vii. Mod Bus Address mapping list for interfacing controller with DCS
 - viii. System/ Process configuration for Performance.

5. COMMISSIONING OF THE SYSTEM

- 5.1. Removal of existing PGPL governor system as per requirement is in the scope of vendor.
- 5.2. The erection, Commissioning, configuration and tuning of the controller & accessories is in the vendor's scope.
- 5.3. Vendor shall be responsible for system integration and commissioning, to troubleshoot and correct any connectivity issues and to tune the system in response to actual system dynamics.
- 5.4. Vendor shall optimize the overall system with respect to appropriate integration and interface with DCS.
- 5.5. Vendor shall replace and commission the equipment in the shortest period of time, so that it can be done in short shutdown of 7 days or maximum 7 days.

6. SPARES PHILOSOPHY:



The system shall meet the following spare philosophy. This philosophy shall be applicable for items like IO's, barriers, isolators, relays, terminals, lamps, push buttons etc. Vendor shall include following spares in their scope of supply:

6.1. INSTALLED ENGINEERING SPARES :

Installed engineering spares shall be provided in each sub-system for each type of electronic module to enhance the specified system functional requirements by 20%. The basis of offering installed engineering spares shall include:

- i. For a system with 20% spare IOs of each type shall be considered for calculating I/O modules.
- ii. 20% spare accessories shall be considered like relays, switches, lamps, fuses, circuit breakers, barriers, isolators, terminals etc.
- iii. The engineering spares shall be wired up to the field cable interface and shall be in ready-to-operate condition when field cable is connected to spare assigned terminals.
- iv. Spare pairs of the incoming cables shall be terminated on spare terminals in the marshaling / barrier cabinets as applicable.
- v. The system shall be fully engineered considering 20% installed engineering spares including processor loading.

6.2. COMMISSIONING SPARES:

Two years commissioning spares of the offered system shall be provided. List of Commissioning spares shall be submitted.

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6.3.MANDATORY SPARES:

10% spares or minimum 01 number of installed ITCC Hardware and barriers of each type shall be offered as optional. List of mandatory spares shall be submitted.

7. SERVICE SUPPORT

The offered ITCC system shall be supported by the vendor for minimum 15 years for all type of hardware, software spares and service supports.

8. TRAINING

Supplier shall provide training to Clients' maintenance engineers at their works and operational staff at owner's site. The training imparted shall be by qualified and experienced staff available. It shall be exhaustive and aimed at making clients' maintenance staff self-reliant for most of the day to day applications. For training, supplier shall make available as close a model of the system with all the representative nodes, as the actual system to be installed. It is envisaged that following be covered in the training:

8.1. Maintenance Staff Training (at vendor's works)

- i. System architecture, hardware and function of each node.
- ii. Complete application software & routine preventive maintenance procedures
- iii. Commonly occurring hardware problems and the maintenance procedures to be followed.

For purposes of training, detailed literature, instruction & maintenance manuals in English shall be arranged by the bidder.

Training shall be in two batches of 03 engineers for 05 days each.

Travelling, Boarding and Lodging will be in NFL scope.

8.2. Operations Staff Training (at NFL Vijaipur site)

This shall broadly cover the following:

- i. System architecture and functions of various keys in the keyboard.
- ii. Access for various displays like graphics, group and trend groups etc and switching between different types of displays etc.
- iii. Alarm handling.

Training shall be in 02 batches of 06 engineers for 02 days each at NFL Vijaipur site.

9. SITE ACCEPTANCE TEST

The system shall be considered acceptable only on compliance of the following.

- a) The system with all sub-system including hardware, software, online redundancy checking, communication system, networking accessories has supplied, installed, pre-commissioned, simulation and finally commissioned to the full satisfaction of the owner.
- b) All Project Engineering Documentation as specified as well as those required for completeness of the system has submitted.

10. ENGINEERING MANUALS

The design and specifications shall be formally documented in the Engineering Manuals and provided in three hard copies and one CD/Pendrive/Harddisk. This includes:

- i. Control system diagrams
- ii. Wiring drawing
- iii. Controller dimensional drawings
- iv. Panel structural and layout drawings
- v. Bill of materials
- vi. Controller instruction manuals and configuration parameters.

11. ASSUMPTION/ BASIS OF PROPOSAL

- i. Bidder must visit the site for exact assessment of scope of supply & services.
- ii. Any civil work shall be in the scope of NFL.
- iii. Inputs for detail Engineering shall be provided by NFL.

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12. DEVIATION.

Any deviation from NIT must be mentioned clearly by the vendor

13. PERFORMANCE GUARANTEE

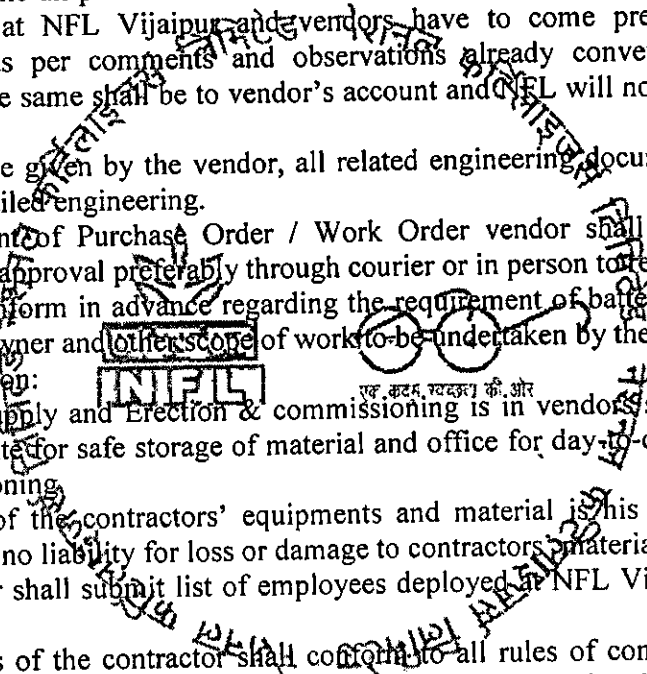
Bidder shall submit a Warranty/ Guarantee Certificate along with supply stating that the supplied material / complete system are guaranteed against any manufacturing / operational defects / poor workmanship, for the period of 12 months from the date of final acceptance of the system or 24 months from the date of final supply, whichever is earlier.

14. NOTE

It is emphasized that this document provides the minimum requirements and does not relieve the Supplier from his responsibility concerning the engineering, supply, erection, reliability, maintainability, safe and successful operation of the complete system.

15. SPECIAL TERMS & CONDITIONS FOR ERECTION AND COMMISSIONING:

- 15.1 As this is a new system, for exact assessment bidder have to visit the NFL Vijaipur site to see the site conditions in respect of control rooms, installation space, existing documentation, etc. at vendor's cost and NFL will not entertain any claim on this account.
- 15.2 After opening the un-priced bids a series of technical review meeting are envisaged, which shall be held at NFL Vijaipur and vendors have to come prepared for discussion / clarifications as per comments and observations already conveyed on their bids. All expenses for the same shall be to vendor's account and NFL will not entertain any claim on this account.
- 15.3 As per schedule given by the vendor, all related engineering documents shall be issued to vendor for detailed engineering.
- 15.4 After placement of Purchase Order / Work Order vendor shall submit all engineering documents for approval preferably through courier or in person to reduce transit time.
- 15.5 Vendor shall inform in advance regarding the requirement of battery limit conditions to be provided by Owner and other scope of work to be undertaken by the Owner
- 15.6 Site Mobilization:
 - a) As the total supply and Erection & commissioning is in vendors scope, the vendor has to mobilize the site for safe storage of material and office for day-to-day work during erection and commissioning.
 - b) The security of the contractors' equipments and material is his own responsibility. The owner accepts no liability for loss or damage to contractors' materials.
 - c) The contractor shall submit list of employees deployed at NFL Vijaipur site with full Bio-data.
 - d) All employees of the contractor shall conform to all rules of conduct, etc. established by owners. Failure to do so will be sufficient cause for removal of such person from the site.
 - e) All materials, tools & tackles, Special tools, measuring tools and consumables, etc. required for execution of work shall be in the contractor's scope. The receipt, offloading, movement and storage of material and tools at site shall be contractor's responsibility. Lifting tools shall be tested and verified by competent authority of M.P State.
 - f) Electricity: The contractor shall inform the owner within 15 days of placement of LOI his electrical power requirements for storage, site office and erection & commissioning. The same shall be provided at one point by the owner and further distribution shall be in contractor's scope. The electrical power shall be provided free of cost to the contractor.
 - g) Messing & Accommodation: The contractor will make his own arrangement for messing and accommodation of contractors' personnel. However, accommodation may be provided by owner on chargeable basis subject to availability.
 - h) First Aid: The contractor may have access to the owner's first aid post if available in case of accident.



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- i) Contractor's manpower shall be equipped with PPE's as per requirement. The PPE's shall be in the contractor's scope.

15.7 Supervision of work at.NFL site:

- a) Erection and commissioning teams including site engineers shall be deputed by the contractor for erection and commissioning of the supplied system
b) The entire work is to be completed as per the time schedule already submitted and approved by the owner. The contractor shall conform to the targets set forth in the time schedule

15.8 Inspection:

The work of the contractor is subject to the inspection by the owner time to time. The suggestion of owner engineers shall be honored by the contractor for the jobs to be carried out at site as per best engineering practices. Minor changes shall not attract any price implication.

15.9 Deployment of Labour at NFL site:

- a) The contractor will deploy no person below the age of 18 years. The wage rates should not be less than the stipulated minimum wage rates, notified by Central Government / MP State Government whichever is higher from time to time with respect to work performed/rendered, without any discrimination on grounds of caste/creed/religion/gender.
b) Normal working hours at site shall be 8 hours from Monday to Saturday. However, as per exigency of work erection and commissioning activities shall be continued beyond 8 hours and even on weekly off days to meet the time schedule of completion. All such overstay charges if any, for contractor's labour shall be the responsibility of the contractor.
c) All notices and instructions issued by the Owner must be strictly adhered to by the Contractor and his employees.
d) The contractor shall arrange labour license, if required, as per rules from State authorities at his own cost and shall submit a copy to the owner.
e) The contractor will take umbrella insurance cover for all his employees for all purposes of claims under Workman's Compensation Act during stay at Owner site and shall submit a copy of the same to the owner. The expenditure incurred for insurance shall be to the contractor's account.
f) Contractor shall have his ESI Registration No. issued by ESI Authorities along with documentary proof. It is the responsibility of the Contractor to ensure Registration and issue of ESI cards to the workmen engaged by him.
g) In case the Owner becomes liable to pay any dues to the labour of the contractor or to any Government Agency or any other agency under any of the provision of the Minimum wages Act, Workmen compensation Act or any other law due to act of omission of the contractor, the owner shall recover the same from the Contractor's bills.

15.10 Working and Safety Regulations:

- a) The contractor shall fulfill all statutory and legal requirements enforced by Central, State Governments and local authorities applying to the work as well as safety requirements for the same.
b) Explosive material/equipment prone to explosion shall not be allowed inside the owner premises. The contractor shall make his own arrangement for fire extinguishers and other safety equipment for his office and storage.
c) Particular attention is drawn to the following: -
i. The contractor shall strictly follow regulations laid down by owner, Factory Inspector, Government and state authorities in all respects.
ii. Compliance with all electricity safety regulations.

- 15.11** After erection & commissioning and handing over of the systems to the owner, contractor shall leave the site only after getting the completion certificate from the owner. The owner shall issue certificate on completion of total package in all respects.

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