INSTITUTE FOR PLASMA RESEARCH
(An Aided Institute of Department of Atomic Energy, Government of India)
Near Indira Bridge; Bhat; Gandhinagar-382428; India

Notice Inviting Tender
(NIT)

निविदा सूचना TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/21-22/037
दिनांकित DATED 30-12-2021

Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR) invites online tenders IN **TWO PART (INR quote only)** for execution of contract in accordance with the purchaser's tender specifications. The invitation to tender, tendering conditions, general conditions of contract, special conditions of contract and additional conditions of contract, if any, which will govern the contract pursuant to the tender are attached.

Bidders interested to submit bid are requested to go through the contents of the NIT and ensure that the bid is submitted online on or before the due date and time indicated in NIT and as per technical specifications and terms and conditions indicated herein and upload digitally signed or ink signed undertaking of Form No. **IPR-LP-ET-02.V5.**

Off line bids including hard copy in any form will not be accepted.

Head-Purchase Section
For and on behalf of Director, IPR
(The Purchaser)

Encl: as above.

निविदा सूचना TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/21-22/037
दिनांकित DATED 30-12-2021

निम्नलिखित के लिए प्रतिष्ठित और योग्य पार्टियों से ई-निविदा विधि के माध्यम से दो भाग में ऑनलाइन निविदा आमंत्रित की जाती है।

Online tender is invited in **TWO PARTS** through e-tendering mode from reputed and eligible parties for the following.

Work/Item Description	Supply, Installation, development and Commissioning of Process Automation System for Large Volume Plasma Device Upgrade (LVPD-U) at Institute for Plasma Research, Gandhinagar as per the detailed specifications mentioned in the tender documents.
Tender Fee	Not Applicable
Earnest Money Deposit (EMD)	Not Applicable. In place of EMD, vendor should upload sealed and signed **"Bid Security Declaration"** as per ANNEXURE-V
Publishing Date	**31-12-2021 at 10:00 Hrs.**
Document Download / Sale Start Date	**31-12-2021 at 10:00 Hrs.**
Seek Clarification Start Date	**31-12-2021 at 10:00 Hrs.**
Seek Clarification End Date	**17-01-2022 by 17:00 Hrs.**
Pre-bid Meeting Date	**20-01-2022** by **11.00 Hrs**
Response to Clarification by IPR	**31-01-2022** by **17.00 Hrs**
Bid Submission Start Date	**01-02-2022** at **10.00 Hrs**
Bid Submission Closing Date	**15-02-2022** at **13.00 Hrs**
भाग-I के ऑनलाइन खोलने का समय और तिथि (तकनीकी बोली) Time and Date of online Opening of PART-I (Technical Bid)	**16-02-2022** at **14.00 Hrs**
भाग-II के ऑनलाइन खोलने का समय और तिथि (मूल्य बोली) Time and Date of online Opening of PART-II (Price Bid)	**Will be declared later on**

Pre-bid meeting with the vendors will be held through Video Conference on **20/01/2022 11:30 Hrs** onwards after receipt of pre-bid queries. The interested vendors are required to register themselves for participation in the pre-bid meeting through the following link on or before: **17/01/2022**.

Link: **https://forms.gle/5rckg5eXQVw3Wyxr8**

The web link to join the scheduled pre-bid meeting through Video Conference along with password will be shared with the registered (for pre-bid meeting participation) vendors only by **18/01/2022**.

If any registered vendor had not received the link to join the video Conference they may contact the Tender Inviting officer @ **nodalofficer.et@ipr.res.in**

It may please be noted that any clarifications required in this tender either technical or otherwise shall be carried out before submission of bids.

The vendors who are interested to visit the site should complete their site visit before the pre-bid meeting in co-ordination with Dr. Ritesh Sugandhi (Mail ID: ritesh@ipr.res.in)

Detailed tender notice along with Eligibility criteria and Tender Document is available on website **https://eprocure.gov.in/eprocure/app** for free view and downloading**.** For participating in the e-tendering process, it is mandatory to get registered on the above e-tender portal and required to have Digital Signature Certificate (Class -III). For new registration/ tendering, bidders may go through the "**Instructions for Online Bid Submission**" provided as under.

A copy of this NIT is also available on the Institute's website **www.ipr.res.in** . For further information, please contact: 079 23962020/2021, Fax: 079 23962277.

Instructions for Online Bid Submission

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: https://eprocure.gov.in/eprocure/app.

REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: https://eprocure.gov.in/eprocure/app) by clicking on the link "**Online bidder Enrollment**" on the CPP Portal which is free of charge.
2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.
5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.
2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or ''Other Important Documents'' area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

Note: *My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.*

SUBMISSION OF BIDS

1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.
4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.
5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

6) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

7) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

8) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

9) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

ASSISTANCE TO BIDDERS

1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

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Form No: IPR-LP-ET-02.V5

TWO-PART TENDER
SECTION – A

Invitation to Tender and Tendering Conditions

1.0 INVITATION TO TENDER

1.1 Institute for Plasma Research (IPR) invites online tenders for supply of Plant, Machinery, Equipment/Components to the specifications detailed in Section "C" to this tender document. The conditions of contract/purchase order which will govern the contract pursuant to the tender are as contained in Section "B" of this tender document. If you are in a position to quote for supply in accordance with the technical specifications indicated in Section "C" to this tender document and as per the conditions stipulated in this Section and Section B, please upload your offer in a manner and method specified below.

2.0 MANNER AND METHOD FOR SUBMISSION OF TENDERS

2.1 All tenderers in response to this invitation shall be submitted through online mode only. Tender submitted by **fax/cable/telegram or any mode other than online will NOT be considered at all** and all such tenders will be rejected without any notice to the tenderer.

2.1.1 **Part-I (Techno-commercial):** This part of the tender shall include/contain documents related to eligibility criteria, all technical details, technical specifications, drawings and also the commercial terms and conditions of contract for the supplies to be made and the services to be rendered **EXCLUDING ANY PRICE DETAILS THEREOF.**

Proof for fulfillment of eligibility criteria mentioned in Annexure-A should be uploaded along with the tender. If the tender is submitted without valid documents, we shall not consider your offer. Tenders received without proof of eligibility criteria will be rejected. The offers which meets the eligibility criteria will only be considered for evaluation.

2.1.2 **Part-II (Price):** This part should contain only the prices of the stores offered for the services to be rendered. Part-II (Price) should be furnished in accordance with the format provided by the Purchaser at Section "D" of this tender document

2.1.3 If tenderer includes prices of any nature in Part-I (Techno-commercial) of the tender such offers are liable for rejection without any notice to the tenderers.

3.0 EARNEST MONEY DEPOSIT (EMD)

3.1 The Tenderer shall submit, as part of its bid, interest free Earnest Money Deposit (EMD) for an amount as specified in the Tender Notice. In the case of foreign bidders, the EMD shall be submitted either by the

principal or by the Indian agent and in the case of indigenous bidders; the EMD shall be submitted by the manufacturer or their specifically authorized dealer/bidder. EMD shall be submitted by way of Demand Draft from **SBI/nationalized banks or any one of the scheduled banks mentioned in the bracket (Axis Bank, HDFC Bank, ICICI Bank and IDBI Bank)** issued in favour of ***"Institute for Plasma Research***" and payable at **Ahmedabad**. **Tender received without EMD will be rejected at the discretion of IPR.**

(Copy of Demand Draft to be uploaded with the quotation, Original DD should be sent to IPR on or before the specified closing date and time)

3.2 The EMD of unsuccessful Tenderer will be discharged/returned after finalizing award of the Contract/placement of Purchase order.

3.3 The successful Tenderers EMD shall be discharged upon the Bidder submitting the Security Deposit as specified in the contract/purchase order, without any interest.

3.4 **Exemption from payment of EMD:** The firms registered with DGS&D, NSIC, DPS or Micro & Small Enterprises (MSEs) which are actual producers/manufacturers of tendered items are exempted from payment of EMD provided valid registration certificate is uploaded along with the offer. In the case of foreign bidders, payment of EMD is exempted if they submit their bid directly or through their Indian agent in **foreign currency** against the tender document bought by them, so that the order can be placed directly on their Principals.

3.5 **The EMD may be forfeited:**

3.5.1 If a Tenderer withdraws or amends or modifies or impairs or derogates its bid during the period of bid validity specified by the Bidder on the Bid Form; or

3.5.2 In case of a successful tenderer, if the tenderer fails to furnish order acceptance within 15 days of the order or fails to submit the Security Deposit within 21 days from the date of contract/order.

4.0 LATE/DELAYED TENDERS

4.1 Uploading of the offer document after the due date and time shall not be permitted. Time being displayed on e-Tendering portal shall be final and binding on the applicant.

5.0 OPENING OF TENDERS

5.1 Unless otherwise pre-opened or postponed with advance intimation to the tenderers, tender will be opened in two stages on the date and time indicated on e-Tendering portal.

5.2 Part-I (Techno-commercial) of the tender will be opened at the first stage on the due date and time indicated for opening on the e-Tendering portal while the Part-II (Price) will be opened at the second stage after completion of the evaluation of the Techno-Commercial Part (Part-I) of the tender.

5.3 While all the tenderers who uploaded tenders within the due date and time will be permitted to participate in the opening of Part-I (Techno-Commercial) of the tender on the due date and time indicated on e-Tendering portal, opening of the Part-II (Price) of the tender can be attended to only by such of those tenderers whose Part-I (Techno-Commercial) of the tenders are found to be technical suitable/

acceptable to the Purchaser and to whom intimation thereof is given by the Purchaser by Email/letter or through e-Tendering portal.

5.4 The tenderers whose Techno-commercial part (Part-I) are found suitable/acceptable to the Purchaser, will be given seven days advance intimation by the Purchaser to enable such tenderers to depute their representative to participate in the opening of the Part-II (Price) of the tender. The technically unqualified tenderers will neither be given any intimation about the date and time of opening of Part-II (Price) of the tender nor will they be permitted to participate in the opening of the same. **Part-II (Price) of the technically disqualified tenderers will not be opened.**

6.0 AUTHORITY LETTER

6.1 The tenderers who wish to participate in the opening of the tenders may depute their representatives to IPR on the respective due date and time as indicated in the tender notice with an authority letter addressed to the Purchase Officer which should be produced to the officers who are opening the tenders, on demand to prove the bonafides of the representative who participates in the opening of the tender. In case the representative of the tenderer fails to produce such an authority letter on behalf of the tenderer, he will be debarred from participating in the opening of the tenders.

6.2 The tenderers representative, who reaches the venue of the tender opening late, i.e. after the starting time specified for opening of the tenders, may not be allowed to take part in the tender opening. It should be noted that only one representative of each tenderer will be permitted to participate in the tender opening.

7.0 EVALUATION OF TENDER

7.1 Evaluation of tender shall be based on all inclusive landed cost.

8.0 PURCHASER'S RIGHTS TO REJECT QUOTATION

8.1 The Purchaser reserves the right to reject any quotation without assigning any reason thereof.

9.0 TECHNICAL CLARIFICATIONS

9.1 After opening of Part-I (Techno-commercial) of the tender, if it becomes necessary for IPR to seek clarifications from the tenderers, the same will be sought for from the tenderers.

10.0 **DATE FOR OPENING OF PART-II (PRICE):**

After completion of technical evaluation, Part-II (Price) of only technically qualified tenderers shall be opened. The date and time of opening of Part-II (Price) shall be intimated only to the technically qualified tenderers. Whose Part-I offers have been found suitable will only be permitted to participate in the opening of the Part-II (Price) of the tender.

11.0 HOLIDAYS

If the date (s) specified for receipt and opening of the tenders is/are declared as holidays abruptly by the competent authority due to any administrative reasons, then the date(s) for opening of tenders will get postponed automatically to the next working day. As for instance, if the due date for receipt of tender and its opening falls on 3rd of a particular month and if the 3rd day of the month is declared as a holiday, then the

opening date of tender will stand automatically postponed to 4th day of the month at the same time. However, due date for submission of tender online will remain same as mentioned in the tender notice.

12.0 **VALIDITY OF OFFERS**

Offers shall be kept valid for acceptance for a period of of 120 (One hundred twenty) days from the date of opening of the tender. Offers with shorter validity period will be liable for rejection.

13.0 **CATALOGUES/TECHNICAL LITERATURE**

Vendor shall upload all necessary catalogues/drawings technical literature data as are considered essential for full and correct evaluation of the offers shall invariably accompany the Part-I (Techno-Commercial) of the tender. The quotations are liable to be ignored if this condition is not complied with.

14.0 **TERMS AND CONDITIONS OF THE CONTRACT**

It must be clearly understood that any contract concluded pursuant to this invitation to tender shall be governed by the General Conditions of the Contract as contained in Section “B" of this tender document. Tenderers must therefore, take special care to go through these general conditions of contract and in exceptional cases if any deviations are proposed, these must be clearly indicated in the Part-I of the tender as a separate annexure instead of merely enclosing their printed conditions of Sale. Tenders made subject to counter conditions or far too many deviations from the general conditions of contract, i.e. Section "B" of this tender document are liable to be ignored. It should also be realised that failure to bring out deviations from the General Conditions of Contract contained in Section "B" of this tender document will imply that the tenderer is willing to execute the contract as per the Purchaser's terms and conditions of contract.

15.0 TENDERING CONDITIONS FOR BIDS

15.1 The prices quoted must be FIRM and preference will be given to such tenders. In exceptional cases (e.g. items involving substantial use of raw materials susceptible to sharp fluctuations in prices) if prices quoted subject to variation it shall be on the basis of a standard 'Price Variation Formula'. The basis for calculation shall be very clearly stated. The responsibility for furnishing the documentary evidence for price variation lies with the vendor. Here again preference will be given to the tenders with a specific ceiling on escalation.

15.2 Prices quoted by the tenderer should include all charges involved for direct and safe-delivery of the stores to the consignee/place of delivery indicated in the tender document. If a tenderer so desires, separate lump sum charges for safe-delivery of the stores to the consignee/purchaser’s site, could be furnished. However, the purchaser reserves the right to call for break-up. The purchaser will neither undertake responsibility for transit insurance nor pay for it separately.

15.3 In respect of tenders on Ex-works basis, in case the tenderer has not mentioned in the offer packing, forwarding and transportation charges for safe delivery up to Purchaser's site, 2% of the price quoted towards packing (in respect of both local and outstation firms), 1% of the basic price quoted towards safe delivery charges in respect of local tenderer and 3% of the basic price quoted towards safe delivery charges in

respect of outstation firm will be added for comparison of offers on safe door delivery at Purchaser's site.

15.4 The stores shall neither be despatched under 'owner's risk' nor consigned to 'self', but only to the consignee's name and address indicated in the Purchase order. Non-adherence to this condition shall make the contractor liable to bear all consequential penalties/expenses such as demurrage, wharf age, etc. which the Purchaser may incur.

15.5 The consignee will, as soon as possible, but not later than 45 days from the date of arrival of stores at destination notify the contractor of any loss or damage to the stores that may have occurred during transit to enable the contractor to repair/rectify the defects/damages or replace the goods as is appropriate, free of all charges. In case it is desired by the contractor for returning of the material to them all expenses towards transportation etc. will be borne by the supplier and also will furnish bank guarantee towards the cost of material.

15.6 In case an Indian supplier/Agent furnishes an offer for supply of out-rightly imported stores, the price of such stores shall be quoted in Indian Rupees for delivery to the consignee's premises exclusive of import duties and on firm price basis.

15.6 **Conditional Discount:** In case the tenderer offers any conditional discount with regard to acceptance of their offer within a specific payment terms, delivery, quantity etc. the purchaser will not take into consideration such conditional discount while evaluating their offer.

16.0 SPARES AND ACCESSORIES

16.1 Tenders for plant/machinery/equipment/component shall also indicate prices for essential accessories, optional accessories and spares necessary for satisfactory operation of the plant/machinery/ equipment.

16.1.1 for a period of two years and

16.1.2 for a period of five years

16.2 Prices for accessories and spares shall be itemized. Tenders where only lumpsum prices are indicated are liable to be ignored. Particular care must be taken to list out each item of spare and quantity recommended and also the individual price for these items. These details should be included only in Part-II (Price) of the tender. However, a list of spares and accessories without Price should be included in Part-I (Techno-Commercial) of the tender.

17.0 QUANTITY

The purchaser reserves the right to accept tenders for any quantity of his choice and the tenderer shall be bound to accept a contract for any quantity. The Purchaser also reserves the right to accept or reject lowest or any tender in full or in part without assigning any reasons.

18.0 STATUTORY LEVIES SUCH AS CUSTOMS DUTY, GOODS AND SERVICE TAX

18.1 **CUSTOMS DUTY**

18.1.1 The Purchaser is entitled for assessment of customs duty at the concessional rate as per Customs Notification No. 51/96-Custom dated 23.7.1996 issued by the Department of Revenue, Ministry of Finance, as amended from time to time, in respect of purchases made for the Research Institutions under the Department of Atomic Energy and the Purchaser will obtain the requisite

certificate from the appropriate authority.

18.1.2 In case an Indian vendor/agent submits an offer for supply of outrightly imported stores in Indian Rupees, they should quote price for free and safe delivery of stores at destination.

18.1.3 Wherever, against a requirement, both indigenous as well as imported offers are received, the offers for imported stores will be evaluated on the basis of the total landed cost after loading the custom duty and other levies as may be applicable from time to time for taking purchase decision.

18.1.4 High Seas sale will not be considered.

18.2 **FLUCTUATION IN THE CUSTOMS DUTY**

18.2.1 Unless otherwise specifically agreed to in terms of the Contract, the purchaser shall not be liable for any claim on account of fresh imposition and /or increase in Customs Duty on raw materials and/or components used directly in the manufacture of the contracted stores, taking place during the pendency of the contract.

18.3 **Offers from Indian Agents on behalf of foreign suppliers:** In case the tender is submitted by an Indian supplier/Indian agent on behalf of their foreign supplier/ principals, following documents should be submitted with the tender, failing which, their offer is liable to be ignored.

18.3.1 Photocopy of the Agency Agreement between the Principals and the Indian Agent showing the percentage or the quantum of agency commission payable and a Letter of Authority from the Principals authorizing the Indian Agents to submit the tender on their behalf.

18.3.2 The type and nature of after sales services to be rendered by the Indian Agent.

18.3.3 Both Indian Agent and Principal/OEM cannot bid simultaneously for the same item/product in the same tender.

18.3.4 The Indian Agents are allowed to quote on behalf of only one foreign Principal/ Supplier against this tender.

18.3.5 Copy of Registration Certificate with DGS&D or DPS.

18.4 **GOODS AND SERVICE TAX**

18.4.1 GOODS AND SERVICE TAX where legally leviable as per relevant HSN code will be admitted and reimbursed at the rate applicable during original delivery date.

18.4.2 GOODS AND SERVICE TAX intended to be claimed should be distinctly shown separately along with the price quoted. Where this is not done, no claim for GOODS AND SERVICE TAX will be admitted at any later stage and on any ground whatsoever.

18.4.3 The Purchaser is entitled for assessment of GST at the Concessional rate as per Notifications issued by the Government, as amended from time to time, in respect of purchases made for the Research and Development applications under the Department of Atomic Energy and other R&D units.

18.4.4 **GST for R&D Unit:** Goods and Service Tax (GST) wherever applicable will be paid extra at actual during the delivery period stipulated in the Purchase order. In terms of notifications issued by the Central Government and Statement Governments, R&D units of Department of Atomic Energy are entitled for IGST @ 5% or CGST @ 2.5% and SGST @ 2.5% as applicable for stores covered under the Purchase Order.

18.4.5 **GST for Services:** As applicable. Specify the SAC codes wherever services are involved.

18.4.6 It would be the responsibility of the contractor to ensure that relevant certificate is obtained from the Purchaser before effecting the delivery of goods ordered failing which the excess tax paid by the contractor shall not be reimbursed by the Purchaser.

18.4.7 When GOODS AND SERVICE TAX is claimed as extra by the vendor in general and on packing charges in particular, the following certificates should be submitted by the vendor to the Paying Authority on the bills itself.

18.4.8 Certified that the goods and packing charges on which GOODS AND SERVICE TAX has been charged have not been exempted under the Central Sales Tax or the State Sales Tax Act or the rules made there-under and the amount charged on account of GST on these goods and packing charges are not more than what is payable under the provision of relevant Act or the rules there-under.

18.4.9 Certified further that we have actually paid GOODS AND SERVICE TAX and are being assessed to GST on packing charges and also that where there are statutory exemption under the Relevant Act/Law of the State Government concerned, we have availed ourselves of it and certified non-availability of such a provision for GST on packing charges wherever claimed.

18.4.10 Certified further in respect of amount claimed into the bill no claim is pending for refund/or admissible. Certified that in the event of our getting refund in whole or in part of the element of GOODS AND SERVICE TAX on packing charges claimed from Government, we shall pass on the benefit to the Purchaser by remitting to Government the amount equivalent to the amount of refund obtained by us.

18.4.11 Further certififed that we abide by the all the provisions of Acts of Governemnt and rules made thereunder especially regarding anti-profiteering provisions.

18.4.12 Certified further that we (our Branch or agent) _____ _____ (address) are registered as dealers in the State of _____ under Local Regn. No._____ and in the State of _____ under Central Regn. No. _____ for the purpose of State/Central Tax.

(Stamp & Signature of the Vendor)

18.4.13 The vendor shall solely be responsible for declaration of Goods and Service Tax made in his invoice and shall indemnify the purchaser from any claim or its liability from concerned authorities at any stage.

18.4.14 Certificate with each bill to the effect that no refund has been obtained in respect of the reimbursement of GST made to vendor during three months immediately preceding the date of the claim covered by the relevant bill.

18.4.15 AN UNDERTAKING to the effect that in case any refund of GST is granted to the vendor by concerned authorities in respect of stores supplied under the contract, they shall pass on the credit to the purchaser immediately alongwith a certificate from their Director/Manager/Proprietor/ Accountant to the effect that the credit so passed on relates to the GST originally paid for the stores

supplied under the contract. In case of their failure to do so within 10 days of the issue of the refund orders to them by the Authorites, the purchaser would be empowered to deduct a sum equivalent to the amount refunded by the authorities without any further reference to the vendor, from any of their outstanding bills against this or any other pending Government Contracts and that no dispute on this account would be raised by the vendor.

18.4.16 Statutory Deductions, as applicable shall be made from the supplier's bill.

18.5 **DEDUCTION OF TAX AT SOURCE (TDS)**

As per Government of India rules, it is mandatory that income tax shall be deducted at source at applicable rates as per relevant act, rules and notifications issued by the government from time to time.

18.5.1 **In case of Indigenous Vendors** (Indian Suppliers who provide indigenous products and services, Indian subsidiaries with permanent establishment in India who supply imported goods and services and paid in Indian currency only): Tax deducted at source will be applicable under Section 194-C for carrying out any work (including supply of labour for carrying out any work) in pursuance of contract as per Income Tax Act 1961. In case of technical or professional services, TDS will be applicable as per under Section 194-J of Income Tax Act 1961.

18.5.2 **In case of Foreign Vendors** (Foreign Suppliers who provide goods from abroad paid in foreign currency and providing technical services by Indian subsidiary paid in Indian currency): The TDS is applicable where services are rendered in India directly or through their Indian counter part against foreign Purchase order / Contract as per the provision of under Section 195 of Income Tax act of India. Wherever DTAA (Double Taxation Avoidance Agreement) agreement exists between India and the supplier country the provisions of the agreement shall be applicable. For getting benefit of DTAA (Double Taxation Avoidance Agreement), the following documents must be submitted, otherwise full TDS will be deducted.

a) No Permanent Establishment in India certificate
b) Tax Residency Certificate (TRC) issued by Tax authorities of their country
c) Form 10F if TRC does not contain required details
d) PAN (Permanent Account Number) details issued by Indian Income Tax Authority

Important Note:

a) Where bifurcation is inappropriate and unacceptable for supply of material and providing services the purchase order / contract will be treated as ***Composite Contract*** and TDS will be deducted on whole contract / purchase order value as per applicable rate.
b) TDS or any other leviable taxes or duties, if applicable, shall be deducted recovered from the Supplier's bill and necessary certificate will be issued to the supplier.

c) Details on relevant sections of Income Tax Act and DTAA treaties can be obtained from https://www.incometaxindia.gov.in/ Pages/acts/ income-tax-act.aspx.

19.0 FLUCTUATION IN STATUTORY LEVIES

Unless otherwise specifically agreed to in terms of the Contract, the purchaser shall not be liable for any claim on account of fresh imposition and/or increase in statutory levies on raw materials and/or components used directly in the manufacture of the contracted stores, taking place during the pendency of the contract. However, any reduction in statutory levies on these raw materials and/or components must be passed on to the Purchaser.

20.0 **SAMPLES/PROTOTYPES**

If any called for shall be submitted free of all charges by the Tenderer and the Purchaser shall not be responsible for any loss or damage thereof for any reason whatsoever. In the event of non-acceptance of the tender, the tenderer will have to make arrangements to remove/collect the sample/prototypes at his own expenses.

21.0 **QUANTITIES**

Quantities indicated are approximate only and one or more of the items of the stores tendered, or a portion of any one or more of the items of such stores may be accepted and the tenderer notwithstanding that his Tender has not been accepted in whole shall be bound to supply contracted quantity to the Purchaser.

22.0 **SUBMISSION OF DRAWINGS**

The tenderer shall furnish all drawings pertaining to the plant/machinery/ equipment/component to the Purchaser along with the tender for correct understanding and appreciation of the tender in quadruplicate. Besides, tenderers should also furnish general arrangement, schematic and such other drawings prescribed by the Purchaser within 4 weeks from the date of receipt of a Purchase Order for approval. Such drawings should be furnished along with Part-I (Techno-Commercial) of the tender. Tenderer's drawing will form part of the purchase order/contract only after these are approved by the Purchaser.

23.0 **INSTALLATION AND COMMISSIONING**

23.1 Wherever, the purchaser's invitation to tender calls for installation and commissioning or supervision of installation and commissioning of the instrument/equipment by the tenderer, the tenderer must clearly and separately quote the prices for the supply of the stores and the charges and the terms for installation and commissioning or supervision of installation and commissioning, as the case may be. The charges towards installation and commissioning should not be included in the price of the stores.

23.2 In respect of contracts involving installation and commissioning by vendors including overseas vendors where identifiable charges for the same has been quoted by the vendor, he shall bear the Income-tax liability as per the rates prevailing at the time of undertaking the job in accordance with the Income-tax Act in force in India.

23.3 Wherever, the scope of the contract includes installation and commissioning, it shall be the sole responsibility of the contractor to undertake the installation and commissioning as and when called for, by the Purchaser.

24.0 **INSPECTION**

24.1 The Contractor shall be responsible for and perform all inspection and testing required in accordance with the contract/purchase order and specifications included therewith.

24.2 The Purchaser may at his option depute his representative for inspection of the stores to be supplied under the contract or authorize and nominate a Quality Surveillance Agency of his choice for the purpose hereinafter called, in either case, the inspection.

24.3 The supplier shall give notice of readiness for inspection to the Purchaser so that the Inspector can be present at the requisite time. In such an event delivery shall not be effected until an authorization or shipping release is obtained from the Purchaser.

24.4 The contractor shall allow reasonable facility and free access to his work/factory and records to the inspector for the purpose of inspection or for ascertaining the progress of delivery under the contract.

25.0 **FACTORY REGISTRATION/SHOP & ESTABLISHMENT CERTIFICATE**

The tenderers shall upload the copy of the Factory Registration/License or Shop & Establishment Certificate as applicable, along with the tender, failing which the tenders are liable for rejection.

26.0 **PRODUCTS WITH ISI MARK**

26.1 Products with ISI mark will be preferred.

26.2 In respect of following categories of item, Purchaser will consider offers for products with ISI mark only:

- Fire Extinguisher
- Building Material
- PVC Pipes & fittings
- Agricultural Implements & sprayers
- Medical instruments such as syringes, needles, BP apparatus etc.

27.0 **SHOP/FACTORY EVALUATION, QUALITY SURVEILLANCE /INSPECTION AND SUBMISSION OF PROGRESS REPORTS**

27.1 The Purchaser or his technical authorities may at his option and prior to evaluation of the tender depute his Inspector or any quality surveillance Agency of his choice to the factory/workshop of the tenderer to assess and establish the manufacturing capability etc. of the tenderer. Similarly, the Purchaser may also depute his inspector/Quality Surveillance agency of his choice for inspection of the plant/machinery/equipment/component during the various stages of manufacture in such an event the tenderer/contractor shall:-

27.1.1 Allow reasonable facility and free access to his factory/work/ records to the Inspector for the purpose of inspection or for ascertaining the progress of manufacture and delivery.

27.1.2 Provide the drawings, toolings, gauges, instruments etc. required for carrying out the inspection work.

27.1.3 Produce an inspection plan to the Purchaser's satisfaction notifying him when check points on the plan are imminent.

27.1.4 Not supply or deliver the plant/machinery/equipment/ component unless and until a Shipping Release or an authorisation for despatch is obtained in a format provided by the Purchaser. Failure to comply with this instruction will not only result in with holding of the payment to the contractor/supplier, but also hold the tenderer/contractor liable for payment of compensation to the Purchaser due to delay in clearance of the Equipment/plant/machinery/ component from the carriers.

28.0 **INSTRUCTION MANUAL**

In respect of plant/ machinery/ equipment/ instrument/ apparatus, where instruction/ operation manual is normally necessary to enable the user to put the plant/machinery/equipment/instrument/ apparatus to proper use, the Contractor shall furnish such an instruction/operation manual specific to the stores being supplied along with the plant/machinery/equipment/instrument/apparatus. The Contractor shall clearly specify in the offer about his readiness to supply instruction/operation manual

29.0 **PACKING**

29.1 Tenderers shall note that packing for shipment shall be in accordance with the instructions outlined in this tender document, each package shall be limited to the size and weights that are permissible under the existing Air and Sea limitations. Even when no packing specification is included in the invitation to tender, it will be Supplier's responsibility to provide appropriate packing depending upon the nature of the supply and the transportation and handling hazards.

29.2 The equipment shall be so packed and protected as not to suffer deterioration, damage or breakage during shipment and storage in a tropical climate.

29.3 Each package shall be properly labeled to indicate the type and quantity of material it contains, the purchase order number, its dimensions and weight and any other necessary data to identify the equipment and relate it to contract.

30.0 **DEVIATIONS TO PURCHASER'S SPECIFICATIONS AND CONDITIONS OF CONTRACT**

30.1 If any deviation or substitution from the technical specifications contained in Section "C" to this tender document is involved, such details should be clearly indicated in Part-I (Techno-Commercial) and should be added as an annexure to Part-I (Techno-commercial) of the tender as otherwise it shall be an admission on the part of the tenderer that he will supply the equipment as specified by the Purchaser. Similarly, deviations to the Purchaser's General Conditions of Contract/Special Conditions of Contract contained in Section "B" of this tender document shall be indicated by the tenderer in another annexure to Part-I (Techno-commercial) of the tenderer.

30.2 Part-II (Price) should be furnished in accordance with the format provided by the Purchaser at Section "D" of this tender document.

31.0 **DELIVERY**

Tenderer should note that no tender will be considered by the Purchaser unless the Tenderer can meet the delivery schedule specified by the Purchaser. All equipments/machinery/plant/ component covered by this tender document should be supplied on or before _____ or _____ month from the date of approval of drawings or ____ month from the date of receipt of free issue materials. The prices quoted by the tenderer should include all charges involved for direct and safe delivery of the items by Road to the project site of the Purchaser. If a tenderer so desires/separate lumpsum charges for transportation and safe delivery to Purchaser's site could be furnished. Purchaser will neither undertake responsibility for transit insurance nor pay for it separately. No other, delivery term will be accepted by the Purchaser.

32.0 **ACCEPTANCE OF TENDERS**

32.1 The purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reasons whatsoever.

32.2 Acceptance of tenders by the Purchaser will be sent by fax, E-mail, letter etc. within the validity date of the tender and such a fax, letter etc. would then be followed by a formal purchase order/contract. The tenderer whose offer is accepted will proceed with the execution of the contract on the basis of such advance acceptance of tenders without waiting for a formal purchase order/contract, and will be responsible to seek and obtain whatever clarifications that are necessary from the Purchaser to proceed with the manufacture without waiting for a formal purchase order/contract and delivery period will be reckoned from the date of the Letter of Intent.

33.0 **SETTLEMENT OF COMMERCIAL TERMS AND CONDITIONS OF CONTRACT**

In case the commercial terms and conditions of sale/contract stipulated in Part-I (Techno-commercial) of the tender submitted by the tenderer are at variance with the Purchaser's General Conditions of all Contracts/Special Conditions of Contract stipulated in Section "B" of this tender document, the Purchase Officer will settle the commercial terms and conditions of contract with the tenderers chosen for award of the contract by holding discussions with them OR by sending Fax/Letter/E-mail etc. In case the concerned tenderer to whom an intimation thereof is given does not respond/fail to respond to communication sent by the Purchaser within the date specified, his tender is liable for rejection at the discretion of Director, IPR and no complaints whatsoever will be entertained from the tenderer for rejection of this tender. The tenderers should not discuss with the technical authorities/user department any of the commercial terms and conditions of contract and any agreement/understanding reached between the tenderer and the technical authorities will not be valid and binding.

34.0 **COMPLIANCE WITH THE SECURITY REQUIREMENTS OF THE PURCHASER**

The Contractor shall strictly comply with the Security Rules and Regulations of the Purchaser in force and shall complete the required formalities including verification from Police and any other authority and obtain necessary prior permission for entry into the Purchasers premises, wherever authorized by the Purchaser.

35.0 **PAST PERFORMANCE**

In case the past performance of the tenderer is not found to be satisfactory with regard to quality, delivery, warranty obligation and non-fulfillment of terms and conditions of the contract, their offer is liable to be rejected by the purchaser.

36.0 CAPACITY & FINANCIAL STANDING

In case it is found that the tenderer does not possess the requisite infrastructure, capacity, capability and their financial standing is not satisfactory, such tender is liable to be rejected by the Purchaser.

37.0 **CONFIDENTIALITY**

Drawings, specifications, prototypes, samples or any other correspondence/details/information provided by the Purchaser relating to the tender or the contract shall be kept confidential by the contractor, and should not be disclosed or passed on to any other person/firm without the prior written consent of the purchaser. This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by the Contractor.

38.0 **RESTRICTED INFORMATION CATEGORIES UNDER SECTION 18 OF THE ATOMIC ENERGY ACT, 1962 AND OFFICIAL SECRETS UNDER SECTION 5 OF THE OFFICIAL SECRETS ACT, 1923**

Any contravention of the above mentioned provisions by the contractor, sub-contractor, consultant, adviser or the employees of the contractor will invite penal consequences under the aforesaid legislation.

39.0 **PROHIBITION AGAINST USE OF THE NAME OF ANY INSTITUTION OF DEPARTMENT OF ATOMIC ENERGY WITHOUT PERMISSION FOR PUBLICITY PURPOSES**

The Contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use the name of any Institution of Department of Atomic Energy for any publicity purpose through any public media like Press, Radio, TV or Internet without the prior written approval of the Purchaser.

40.0 **FREE ISSUE MATERIAL** (*This clause shall apply only to contracts for supply of fabricated equipment with purchaser's Free Issue Materials (FIM).*

40.1 Wherever contracts envisage supply of Free Issue Material (FIM) by the Purchaser to the contractor, such Free Issue Material shall be safeguarded by an insurance policy to be provided by the Contractor at his own cost for the full value of such materials and the insurance policy shall cover, the following risks specifically and shall be valid for six months beyond the contractual delivery date.

- **Risk to be covered:** Any loss or damage to the Purchaser's material due to fire, theft, riot, burglary, strike, civil commotion, terrorist act, natural calamities etc. and any loss or damage arising out of any other causes such as other materials falling on purchaser's materials.

- **Insured by:** (Name of the Contractor)

- **Beneficiary:** Institute for Plasma Research, Near Indira Bridge, Bhat, Gandhinagar-382428.

- **Amount for which insurance policy to be furnished:** The amount will be indicated in the respective contract.

Free Issue Material (FIM) will be issued to the Contractor only after receipt of the Insurance Policy from the Contractor. The contractor shall arrange collection of the FIM from the Purchaser's premises and safe transportation of the same to his premises at his risk and cost.

Notwithstanding the insurance cover taken out by the Contractor as above, the contractor shall indemnify the purchaser and keep the Purchaser indemnified to the extent of the value of free issue materials to be issued till such time the entire contract is executed and proper account for the FIM is rendered and the left over/surplus and scrap items are returned to the Purchaser. The contractor shall not utilize the Purchaser's free issue materials for any job other than the one contracted out in this case and also not indulge in any act, commission or negligence which will cause/result in any loss/damage to the Purchaser and in which case, the Contractor shall be liable to the Purchaser to pay compensation to the full extent of damage/loss. The Contractor shall be responsible for the safety of the free issue materials after these are received by them and all through the period during which the materials remain in their possession/control/ custody. The free issue materials on receipt at the Contractor's works shall be inspected by them for ensuring safe and correct receipt of the material. The Contractor shall report the discrepancies, if any, to the Purchaser within 5 days from the date of receipt of the material. The Contractor shall take all necessary precautions against any loss, deterioration, damage or destruction of the FIM from whatever cause arising whilst the said materials remain in their possession/custody or control. The FIM shall be inspected periodically at regular intervals by the Purchaser for ensuring safe preservation and storage. The contractor shall also not mix up the FIM with any other goods and shall render true and proper account of the materials actually used and return balance remaining unused material on hand and scrap along with final product and if it is not possible within a period of one month from the date of delivery of the final product covered by this purchase order. The Contractor shall also indemnify the Purchaser to compensate the difference in cost between the actual cost of the FIM lost/damaged and the claim settled to the Purchaser by the insurance company. The decision of the Director, Institute for Plasma Research, as to whether the Contractor has caused any loss, destruction, damage or deterioration of the FIM while in his possession, custody or control from

whatever cause arising and also on the quantum of damage suffered by the government, shall be final and binding upon the Contractor.

41.0 EXPORT LICENCE/EXPORT PERMISSION

41.1 It is entirely the responsibility of the vendors who are quoting for materials of foreign origin to ensure obtaining export permission/licence/authorisation as required from the respective Government before arranging shipment. This Department would not accept post supply inspection by any agency/authority of any foreign country. It is, therefore, necessary that the vendors offering materials from foreign countries shall have thorough knowledge of export contract regulations in vogue in those countries.

41.2 The vendors shall indemnify the purchaser against any consequences in respect of any end-use declaration they/their overseas Principals may furnish to the government/government agencies of the country of origin of the materials, while seeking export permission/licence. Post supply inspection, contrary to the terms and conditions of purchaser's contract shall be deemed to be null and void.

42.0 **END USE CERTIFICATE**

42.1 Whenever an End-use Certificate is desired by the vendor, the same shall be clearly mentioned in the quotation and the purchaser shall provide an Enduser Certificate as per the format given below. The Purchaser will not provide any other document/declaration in this regard.

END USER STATEMENT:

"We hereby certify that the item/s i.e._____, being procured from M/s_____ against our Purchase Order No._____ dated _____ will be used for _____. We also certify that the item/s will not be used in designing, developing, fabricating or testing of any chemical, biological, nuclear, or weapons of mass destruction or activities related to it. It is further certified that we will not re-export the Item/s prior to obtaining permission from the concerned authorities as may be required".

43.0 **COUNTRY OF ORIGIN**

43.1 Wherever the tenders are for imported stores, the Country of Origin of the stores must be clearly specified in the quotation.

44.0 **LIABILITY**

44.1 Vendors shall be liable for any damage to the purchaser or any third party out of any patent or latent defect in the goods supplied by him or sub-standard services rendered by him.

45.0 RIGHT TO REJECT QUOTATION

45.1 The Purchaser reserves the right to reject any quotation, which is not in conformity with the above instructions.

45.2 The Purchaser also reserve the right to reject any quotation without assigning any reason whatsoever.

46.0 **PRICE / PURCHASE PREFERENCE**

Purchase/Price preference to industries will be given as per the policy of the Government of India in force at the time of evaluation provided their offer is in compliance with the conditions of the policy.

47.0 **PERMANENT ACCOUNT NUMBER (PAN**

47.1 Vendors are required to upload a true copy of the PAN Card/Letter issued by the Income-tax Department, failing which the tenders are liable to be rejected.

48.0 MSE bidders should declare their UAM (Udyog Aadhar Memorandum) number on CPPP portal to avail benefits as per Public Procurement Policy for MSE's order 2012.

49.0 The bidder shall not be under a declaration of ineligibility for corrupt or fraudulent practices or blacklisted with any of the Government Agencies.

Any additional conditions attached to this Invitation to Tender shall also form part of the contract conditions.

SECTION ‘B’

GENERAL CONDITIONS OF CONTRACT

INSTITUTE FOR PLASMA RESESARCH
PURCHASE SECTION

GENERAL CONDITIONS OF ALL CONTRACT
&
SPECIAL CONDITIONS OF CONTRACT GOVERNING SUPPLIES OF PLANT AND MACNHINERY

GENERAL CONDITIONS OF CONTRACT

1. DEFINITIONS

1.1 The term 'PURCHASER" means the Institute for Plasma Research or its successors or assigns.

1.2 The term 'PARTICULARS' means the following:

1.2.1 Specification

1.2.2 Drawing

1.2.3 Sealed pattern denoting a pattern sealed and signed by the Inspector

1.2.4 Proprietary make denoting the produce of an individual firm

1.2.5 Any other details governing the construction manufacture and/or supply as existing for the contract.

1.3 The term 'CONTRACTOR' or 'SUPPLIER' means, firm or company with whom or with which the order for the supply of stores is placed and shall be deemed to include the Contractors/Successors (approved by the Purchaser), representatives, heirs, executors and administrators unless excluded by the contract.

1.4 The term 'CONTRACT' or 'PURCHASE ORDER' means and comprises of a Letter or Email or ink signed or digitally signed document conveying acceptance of Contractor's offer and invitation to tender, tender containing offer, advance acceptance of offer, general and special conditions of contract specified in the acceptance of offer and any subsequent amendments/alterations thereto made on the basis of mutual agreement.

1.5 The term 'STORES' or 'MATERIAL' means, the goods specified in the contract/purchase order which the contractor has agreed to supply under the contract.

1.6 The term 'SUB-CONTRACTOR' or 'SUB-SUPPLIER' means any contractor or supplier engaged by the contractor or the supplier with the prior approval of the Purchaser in relation to the contract/purchase order.

1.7 The term 'INSPECTOR' or 'QUALITY SURVEYOR' means any person nominated and deputed by the purchaser or their appointed Consultants or Quality Surveillance Agency or any other person from time to time authorized by the Purchaser to act as his representative for the purpose of inspection of stores under the contract/purchase order.

2. AUTHORITY OF PERSON SIGNING THE CONTRACT ON BEHALF OF THE CONTRACTOR

The person signing the contract or the purchase order or any other document in respect of the contract or purchase order on behalf of the contractor shall deemed to warrant that he has the authority to bind the contractor.

3. SUBLETTING OF CONTRACT OR BILLS OR ANY BENEFIT ACCRUING THEREFROM

3.1 The Contractor shall not sublet, transfer or assign the Contract or any part thereof or bills or any other benefits, accruing therefrom or under the contract without the prior written consent of the Purchaser (All Sub-contractors are required to be appraised and approved by the Purchaser before placement of orders by the Contractor/Supplier). However, such consent shall not be unreasonably withheld by the Purchaser, if such stores are not normally manufactured by the Contractor, such assignment or subletting shall not relieve the Contractor from any contractual obligation or responsibility under the Contract.

3.2 Any breach of this condition shall entitle the Purchaser to cancel the Contract or any part thereof and to purchase from other sources at the risk and cost of the Contractor and shall recover from the Contractor damages arising from such cancellations.

3.3 In case the Contractor sublets, transfers or assigns any part of the Contract with the prior written consent of the Purchaser, all payments to the Sub-Contractor shall be the responsibility of the Contractor and any requests from such sub-Contractor shall not be entertained by the Purchaser.

4. SECURITY DEPOSIT

4.1 On acceptance of tender, the Contractor shall at the option of the Purchaser and within the period specified by him, submit a Bank Guarantee from SBI or any one of the nationalized banks or reputed private banks, viz. AXIS Bank, ICICI Bank, IDBI Bank and HDFC Bank towards Security Deposit not exceeding 10% (ten percent) of the tendered value of the contract/purchase order valid till at least 2 months beyond the acceptance date of the material, as the Purchaser shall specify.

4.2 If the Contractor is called upon by the Purchaser to submit Security Deposit and the contractor fails to provide the same within the period specified such failure shall constitute a breach of the Contract and the Purchaser shall be entitled to make other arrangements for the repurchase of the stores contracted for at the risk and expenses of the Contractor in terms of clause 9.2.4 hereof and/or recover from the Contractor damages arising from such cancellation. No claim shall lie against the purchaser either in respect of interest if any due on Security Deposit or depreciation in value.

4.3 Offers wherein contractors declined to submit Security Deposit are liable to be rejected.

5. DRAWINGS & SPECIFICATIONS

5.1 The drawings and specifications are intended to be complementary and to provide for an comprise everything necessary for the completion of supply. Any material shown on the drawing even if not particularly described in specifications or vice versa is to be supplied by the Contractor as if it were both shown and specified.

5.2 Should any discrepancy be noted in the drawings and/or specifications and should any interpretation of the same be required, the matter shall be referred to the Purchaser for clarification which shall be binding upon the contractor. Otherwise, the contractor shall assume responsibility for the interpretation of the drawings and specifications including interpretation by his sub-contractors.

5.3 Should any difference or dispute arise with regard to the true intent and meaning of drawings or specification or should any portion of the same be obscure or capable of more than one interpretation, the same shall be decided by the Purchaser whose decision shall be final.

5.4 All lettering on the drawings is t be considered as part of the specification and contract. In all cases figured dimensions are to be followed rather than those indicated by scale. Large scale drawings will take precedence over small scale drawings.

5.5 The contractors drawings shall, when approved by the Purchaser, be deemed to be included in the list of drawings which form part of the contract. The Contractor shall not proceed with fabrication until all drawings associated therewith have been duly approved by the Purchaser.

5.6 The Contractor shall be responsible for and shall pay for any alterations of the stores and shall indemnify the Purchaser for any consequential expenditure incurred by the Purchaser due to any discrepancies, errors, omissions in the drawings or other particulars supplied by him whether such drawings or specifications have been approved by the Purchaser or not, provided that such discrepancies, errors or omissions be not due to inaccurate information or specifications furnished to the contractor on behalf of the Purchaser.

5.7 **General Warranty**

5.7.1 The stores supplied by the contractor under the contract shall be of best quality and workmanship. The contractor shall supply the stores in accordance with the contract specifications unless any deviation has been expressly specified in the contract and any amendments agreed thereto.

5.7.2 The contractor's offer to supply stores in accordance with the tender specifications shall be deemed to be in admission on his part that he has fully acquainted himself with the details thereof and no claim shall lie against the Purchaser on the ground that the contractor did not examine or acquaint himself fully with the tender specifications.

5.8 **Contractor's Liability for Defective Stores**

5.8.1 For a period of twelve months after the stores have been accepted by Purchaser the Contractor shall be responsible for any defects that may be discovered therein notwithstanding that such defects could have been discovered at the time of inspection or any defects therein are found to have developed under proper use, arising from faulty materials, design or workmanship and the Contractor shall remedy all such defects as aforesaid at his own cost provided he is called upon within a period of 14 months from the date of acceptance thereof to do

so, by the Purchaser who shall state in writing in what respect the goods are faulty and further if in the opinion of the Purchaser the defects are of such a nature that it is necessary to replace or renew any defective stores, such replacement or renewal shall be made by the Contractor without any extra costs to the Purchaser, provided notice informing the Contractor of the defect is given by the Purchaser within the said period of 14 months. The decision of the Purchaser notwithstanding any prior approval or acceptance of the Inspector as to whether or not the stores delivered are defective or any defect has developed within the said period of twelve months or as to whether the nature of defects renewal or replacement shall be final conclusive and binding on the Contractor.

6. ALTERATIONS

6.1 The Purchaser may, from time to time, make changes in the drawings specifications and issue additional instructions without altering the purchase order in any manner provided that no changes shall have been ordered which materially alter the character and scope of the supply under the contract.

6.2 It shall be lawful for the parties to the contract to alter by mutual consent at any time and from time to time the drawings and specifications and as from the dates specified by him stores to be supplied shall be in accordance with such altered drawings and specifications provided that if any such alterations involve increase or decrease in the cost of or in the period required for production, a revision of the contract price and/or the period prescribed for delivery shall be made by mutual agreement in respect of the stores to which the alteration applies. In all other respects, the contract shall remain unaltered.

7. SAMPLES

7.1 Samples submitted for any reason shall be supplied without charge and freight paid without any obligation of the Purchaser as regards safe custody or safe-return thereof. All samples submitted must be clearly labelled with the Contractor's name and address and tender number. If the Contractor submits the sample with his tender the same shall not govern the standard of supply except when it has been specifically stated in the Purchase Order that it is accepted instead of any sealed pattern. Should certified samples be lent to the Contractor by the Purchaser, the Contractor is responsible for the return in perfect order of all certified samples with the labels intact.

8. PACKING

8.1 The contractor shall be held responsible for the stores being sufficiently and properly packed for transport by rail, road, sea or air so as to ensure their being free from any loss or damages on arrival at their destination. The packing and marking of packages shall be done by and at the expenses of the Contractor. Each package shall contain a Packing

Note quoting Purchase Order number and date and showing its contents in detail.

8.2 Unless otherwise provided in the contract all containers (including packing cases, boxes, tins, drums and wrappings) in which the stores are supplied by the contractor shall be considered as property of the Purchaser and their cost as having been included in the contract price.

9. DELIVERY:

9.1 **TIME FOR AND DATE OF DELIVERY, THE ESSENCE OF THE CONTRACT:**

The time for and the date of delivery of the stores stipulated in the purchase order/contract shall be deemed to be of the essence of the contract and delivery must be completed not later than the date/dates stipulated.

9.2 **EXTENSION OF DELIVERY SCHEDULE**

9.2.1 If any delay in delivery shall have arisen from any cause such as strike, Lock-outs, fire, accidents, riot or the like which the purchaser may admit as reasonable ground for grant of extension of delivery schedule, the purchaser will allow such additional period for the purpose as he may consider necessary taking the circumstances into consideration.

9.2.2 If the contractor fails to deliver the stores or any instalment or part thereof within the period fixed for such delivery or such additional period allowed by the purchaser in accordance with foregoing paragraphs or any time before the expiry of such period repudiates the contract, the Purchaser may without prejudice to the rights of the purchaser.

9.2.3 Recover from the contractor as Liquidated Damages and not by way of penalty as detailed under clause No.222 given herein below for any stores which the contractor has failed to deliver within the period fixed for delivery in the contract or such additional period as mentioned in paragraph 9.2.1. during which the delivery of such stores, may be in arrears where delivery thereof is accepted after expiry of the aforesaid period. (For the purpose of computing the damages for delayed supplies under the clause, the cost of the entire plant/machinery/equipment/instrument will be taken into consideration if the plant/machinery/equipment/instrument cannot be put to the intended use for want of delayed portion of supply).

9.2.4 Purchase or authorise the purchase elsewhere without notice to the contractor, on account and at the risk of the contractor of the stores not so delivered or others of a similar description (where stores exactly complying with the contract specification are not in the opinion of the Purchaser, which opinion shall be final, readily procurable) without cancelling the contract in respect of the portion instrument not yet due of delivery, OR

9.2.5 Cancel the contract or portion thereof and if so desired purchase or authorise purchase of the stores not so delivered or others of a similar description (where stores exactly complying with the contract specification are not in the opinion of the Purchaser, which opinion shall be final, readily procurable) at the risk and cost of the contractor, if the contractor had defaulted in the performance of the original contract, the purchaser shall have the right to ignore his offer in response to risk purchase enquiry even though the lowest.

9.2.6 Where action is taken under sub-clause 9.2.4 or sub-clause 9.2.5 above the contractor shall be liable for any loss which the purchaser may sustain on that account provided that the repurchase, or if there is an agreement to repurchase then such agreement, is made within a reasonable period from the date of such failure, depending upon the nature / merit of the purchase and in case of repudiation of the contract before the expiry of the aforesaid period of delivery, shall not be entitled to any gain on such purchase and the manner and method of such purchase shall be in the entire discretion of the Purchaser. It shall not be necessary for the purchaser to serve a notice of such purchase on the contractor.

10. INSPECTION

10.1 The contractor shall be responsible for and perform all inspection and testing required in accordance with the contract/purchase order and specifications included herewith.

10.2 The Purchaser may at his option depute his representative for Inspection of the stores to be supplied under the contract or authorize and nominate a Quality Surveillance Agency of his choice for the purpose hereinafter called, in either case, the inspection.

10.3 The contractor shall give notice of readiness for inspection to the Inspector (deputed under clause 10.2 above) so that the Inspector can be present at the requisite time. In such an event delivery shall not be effected until an authorization or shipping release is obtained from the Purchaser's Inspector.

10.4 The contractor hall allow reasonable facility and free access to his work/factory and records to the inspector for the purpose of inspection or for ascertaining the progress of delivery under the contract.

11. RECTIFICATION AND REPLACEMENT OF DEFECTIVE STORES

11.1 If the inspector find that the contractor has executed any unsound or imperfect work, the inspector shall notify such defects to the contractor and the contractor on receiving the details of such defects or deficiency, shall at his own expenses, within seven days or otherwise within such time as may be mutually agreed upon as reasonably necessary, proceed to alter, reconstruct or remanufacture the stores to the requisite standard and specifications as called for by the tender specification.

12. INSPECTION AND REJECTION

12.1 **Inspection and Rejection**: The stores shall be tendered by the Contractor for inspection at such places as may be specified by the Inspector, at the Contractor's own risk, expenses and costs and shall lie at such places of inspection at the risk of the Contractor and the stores will be subject to inspection and test as may be considered necessary by the inspector and his decision as regards rejection of goods shall be final and binding on the Contractor. If any goods are rejected as aforesaid, then without prejudice to the foregoing provision, the Purchaser shall be at liberty to

12.1.1 Allow the Contractor to re submit without prejudice to the Purchaser's right to claim and recover Liquidated damages as provided in clause 9.2.3 hereof, stores in replacement of those rejected within a time specified by the Purchaser (which time shall be essence of the contract), the contractor bearing the

cost of freight for such replacement without being entitled to any extra payment, or

12.1.2 Buy the quantity of stores rejected or others of a similar nature elsewhere at the risk and cost of the Contractor in accordance with the provisions contained in second paragraph of clause 9.2.4 thereof without effecting the Contractor's liability as regards the supply of any further consignments due under the Contract, or

12.1.3 Terminate the Contract and recover from the Contractor the loss Purchaser thereby incurred

12.2 **Removal of rejection**: Any stores submitted for inspection and rejected by the Inspector must be removed by the Contractor within fourteen days from the date of receipt of intimation of rejection, provided that in the case of dangerous infected or perishable stores, the Inspector (whose decision shall be final) shall notify the Contractor to remove such stores within 48 hours of receipt of intimation of rejection and it shall be the duty of the Contractor to remove them accordingly. Such rejected stores shall lie at the Contractor's risk from the time of such rejection and if not removed within the aforementioned time, the Purchaser shall have the right either to return the rejected stores to the Contractor at the Contractor's risk by such mode of transport as Purchaser may select or to dispose off or segregate such stores as he thinks fit at the Contractor's risk and on his accounts and to appropriate such portion of the proceeds as may be necessary to cover any loss or expenses incurred by the Purchaser in connection with the said sale. Freight to destination of stores rejected after examination at destination shall be recoverable from the Contractor at the Tariff Rate.

12.3 **Test Certificate and Guarantees:** Test Certificate Guarantees, if required by the Inspector shall be obtained and furnished by the Contractor free of costs.

13. RECOVERY OF SUMS DUE

13.1 Whenever any claim for payment of, whether liquidated or not, moneys arises out of or under this contract against the Contractor the Purchaser shall be entitled to recover sum by appropriating, in part or whole, by encashing the Bank Guarantee submitted towards Security deposit by the Contractor, if a Security Deposit is taken against the Contract. In the event of the security being insufficient or no Security Deposit has been taken from the Contractor then the balance or the total sum or which at any time hereafter may become due to the Contractor under this or any other contract with the Purchaser, should this sum be not sufficient to cover the full amount recoverable, the Contractor shall pay to the Purchaser on demand the remaining balance due. Similarly, if the Purchaser has or makes any claim, 'whether liquidated or not against the Contractor under any other contract with the Purchaser the payment of all moneys payable under the contract to the contractor including the security deposit shall be withheld till such claims of the Purchaser are finally adjudicated upon and paid by the Contractor.

13.2 All demurrage, wharfage and allied expenses incurred by the Purchaser, if any, due to delayed clearance of Stores in view of non receipt, incomplete or delayed receipt of documents by the Purchaser, shall be recovered from the payment due to the Contractor.

14. BAR/PERT CHART

14.1 The contractor at the discretion of the Purchaser shall submit the BAR/PERT chart indicating various activities from the date of purchase order to handing over of the stores.

15. PERFORMANCE BANK GUARANTEE

15.1 In the event of acceptance of the offer in respect of plant, machinery, equipment, instrument, etc. the tenderer will be required to submit a performance bank guarantee for 10% of the total value of the stores inclusive of all statutory levies and other charges admitted in the contract, from SBI/any nationalized bank or private sector banks, namely, ICICI Bank, IDBI Bank, HDFC Bank and AXIS Bank, on a non-judicial stamp paper of appropriate value valid till 2 months beyond the expiry date of warranty period as per the Purchaser's format towards satisfactory performance of the plant, machinery, equipment, instrument, etc. during the warranty period. In case of bids in currency other than INR performance bank guarantee shall be furnished from any bank of international repute.

15.2 In case of non-submission of performance bank guarantee by the Contractor, an amount equivalent to 10% of the total value of the stores and other charges admitted in the contract will be retained by the purchaser till the expiry of the warranty period of the stores.

15.3 Offers of the tenders who are not agreeable to furnish performance bank guarantee or retaining of an equivalent amount by the purchaser as per clause No.15.1 and 15.2 above, are likely to be rejected.

16. PERMIT AND LICENCES

16.1 The contractor shall secure and pay all licenses and permit at his end which he may be required to comply with all laws ordinances and regulations of the public authorities in connection with the performance of his obligations under the contract. The contractor shall be responsible for all damages and shall indemnity and save the purchaser harmless from against all claims for damages and liability which may arise out of the failure of the contractors to secure and pay for any such licenses and permits or to comply fully which any and all applicable laws ordinances and regulations.

17. PATENTS & PATENT RIGHTS INDEMNIFICATION

17.1 The Contractor shall indemnify and keep indemnified the Purchaser from and against any and all claims, actions, costs, charges and expenses arising from or for infringement of patent rights, copy right or other protected rights, of any design plans, diagrams, drawings in respect of the stores supplied by the contractors or any of the manufacturing methods or process adopted by contractor for the stores supplied under the contract.

17.2 In the event of any claim being made or action being taken against the purchaser in respect of the matter referred to clause 17.1 above, the contractor shall promptly be notified thereof and he shall at his own expense, conduct all negotiations for the settlement of the same and any litigation that may arise therefrom.

17.3 In the event of any designs, drawing, plans or diagrams or any manufacturing methods or process furnished by the contractor constituting infringement of patent or any other protected rights and use thereof is restrained, the contractor shall procure for Purchaser, at

no cost to the latter, the rights to continue using the same or to the extend it is possible to replace the same so as to avoid such infringement and subject to approval by the Purchaser or modify them so that they become non-infringing, but such modifications shall otherwise be to the entire satisfaction of the Purchaser.

17.4 The provision of the clause remains effective and binding upon the Contractor even after the completion, expiration or termination of the contract.

18. LAW GOVERNING THE CONTRACT

18.1 This Contract shall be governed by the laws of India for the time being in force. The marking of all stores supplied must comply with the requirements of India Acts relating to Merchandise Marks and all the rules made under such Acts.

19. JURISDICTION

19.1 The Courts within the local limits (i.e. Gandhinagar) of whose jurisdiction the place from which the purchase order is issued is situation only shall, subject to Arbitration Clause, have jurisdiction to deal with and decide any matter out of this Purchase Order/Contract.

20. SETTLEMENT OF DISPUTES

20.1 The Purchaser and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

20.2 If the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.

21. ARBITRATION

21.1.1 In the event of any dispute or difference arising out or of in connection with any of the terms and conditions of the Purchase Order/Contract, the matter shall be referred to the Director, IPR for settlement. In case the parties to the Purchase Order are not in a position to settle the dispute mutually, the matter shall be referred to a Sole Arbitrator to be appointed in accordance with the Arbitration & Reconciliation Act, 1996 & Arbitration and Conciliation (Amendment) Act, 2015 as amended time to time.

22. LIQUIDATED DAMAGES

22.1 As per Standard Terms & conditions, the Purchaser reserves the right to levy the Liquidated Damages, for delay in supply beyond the contractual delivery date at the rate of half percent (0.5 percent) of the total Contract price (Basic price) for each calendar week of delay. The total liquidated damages shall not exceed five percent (5%) of the contract price (Basic price). Stores/Goods will be deemed to have been delivered only when all its component parts are also delivered. If certain

components are not delivered in time, the Stores/Goods will be considered as delayed until such time as the missing parts are delivered.

22.2 Where the Contract entered into is a composite one with supply cum erection and installation/commissioning activities and the completion of erection and installation/commissioning is delayed irrespective of the fact that whether supply of material has been made within the original delivery period, the contract is to be considered as a whole and Liquidated Damages will be recovered on the total contract value.

23. EXERCISING THE RIGHTS AND POWERS OF THE PURCHASER

23.1 All the rights, discretions and powers of the Purchase under the contract shall be exercisable by and all notices on behalf of the Purchaser shall be given by the Purchase Officer and any reference to the opinion of the Purchaser in the terms and conditions contained in these General Conditions of all Contracts shall mean and be construed as reference to the opinion of any of the persons mentioned in this clause.

24. TRAINING

24.1 The successful tenderer shall, if required by the Purchaser, provide facilities for the practical training of Purchaser's engineering or technical personnel for their active association on the manufacturing process throughout the manufacturing period of the Contract/stores, number of such personnel to be mutually agreed upon. If demanded by the Purchaser, such training shall be conducted at Purchaser's site by the Contractor free of charge. The duration of training shall be mutually decided upon by the Purchaser and the Contractor.

25. RISK PURCHASE

25.1 In the event supplier fails to fulfill the contractual obligations as per the terms and conditions of the Contract, the Purchaser has an option of completing the Contract at the risk and expenses of the Contractor. While initiating risk purchase at the risk and expenses of the supplier, the Purchaser must satisfy himself that the supplier has failed to deliver and he has been given all the opportunities as per the Contract to execute the Contract and also adequate and proper notice. Wherever risk purchase is resorted to, the supplier is liable to pay the additional amount spent by the government, if any as compared to contracted amount. All the factors including the method of recovering such amount should also be considered while taking a decision to invoke the risk purchase.

26. LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

26.1 Any sum of money due and payable to the Contractor under any contract may be withheld or retained by way of lien by the purchaser or any other person or persons contracting through the Director, IPR against any claim of the Purchaser or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Purchaser or with other such person or persons.

26.2 It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Purchaser will be kept withheld or retained as such by purchaser till this claim arising out of in the same

contract or any other contract is either mutually settled or determined by the arbitrator, and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

SPECIAL CONDITIONS OF CONTRACT GOVERNING SUPPLIES OF PLANT AND MACHINERY

In addition to the General Conditions of Contract hereinbefore set out the following special conditions shall apply to contracts for the supply of Plant and Machinery and manufactured equipment. These Special Conditions where they differ from the General Conditions shall over-ride the later.

27. DEFINITION OF PLANT

27.1 The word “”PLANT” wherever, appears in these "Special Conditions of Contract governing supplies of Plants and Machinery" shall mean all machinery, plants, equipment or parts thereof or what the Contractor agrees to supply under contract as specified in the Purchase Order.

28. MISTAKES IN DRAWING

28.1 The Contractor shall be responsible for and shall pay for an alterations of the works due to any discrepancies, errors or omissions in the drawings or other particulars supplied by him whether such drawings or particulars have been approved by the Purchaser or not.

29. RESPONSIBILITY FOR COMPLETENESS

29.1 All fittings or accessories which may not be specifically mentioned in the specification but for which are usual or necessary, are to be provided by the Contractor without extra charge and the plant must be complete in all respects.

30. REJECTION OF DEFECTIVE PLANT

30.1 If the completed plant or any portion thereof before it is finally accepted is found to be defective or fails to fulfill the requirements of the contract, the Purchaser shall give the Contractor notice setting forth with the details of such defects or failure and the contractor shall forthwith rectify the defective plant or alter the same to make comply with the requirement of the contract. Should the contractors fail to do so within a reasonable time the Purchaser may reject and replace at the cost of the Contractor, the whole or any portion of the Plant as the case may be, which is defective or fails to fulfill the requirement of the contract. Such replacement shall be carried out by the Purchaser within a reasonable time and at reasonable price and where reasonably possible to the same specifications and under competitive conditions. The Contractor shall be liable to pay to the Purchaser the extra cost, if any, of such replacement delivered and or erected as provided for in the contract such extra cost being the difference between the price paid by the Purchaser under the provisions above mentioned for such replacement and the contract price for them. Contractor shall refund to Purchaser any sum paid by the Purchaser to the Contractor in respect of such defective plant.

31. INSPECTION AND FINAL TESTS

31.1 All tests necessary to ensure that the plant complies with the particulars and guarantees shall be carried out at such place or places as may be determined by the inspector. Should, however, it be necessary for the final tests as to performance or guarantees to be held over until the Plant is erected at site they shall be carried out within

one month of completion of erection.

32. TRANSPORT AND RESPONSIBILITY FOR BREAKAGES EN-ROUTE

32.1 Unless otherwise specified the Purchaser will take delivery of the plant from the place named in the purchase order but the contractor will be responsible for any damage which may be caused to the Plant during transit to the site of erection thereof.

33. ERECTION AND COMMISISONING

33.1 In all cases where contracts provide for supervision of erection and commissioning or for test at the Purchaser's premises the Purchaser except where otherwise specified, shall provide free of charge, such labour, materials, fuels, stores, apparatus and instruments as may be required from time to time and as may reasonably by demanded by the contractor to carryout efficiently such supervision of erection and commissioning and for the requisite test. In case of contracts requiring electricity for the completion of erection, commissioning and testing at site, such electricity shall be supplied free to the contractor.

33.2 Action by the Purchaser under the clause shall not relieve the contractor of his warranty obligations under the contract.

34. WARRANTY

34.1 The contractor warrants that stores to be supplied under the contract shall be free from all defects and faults in materials, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for stores of the types under the contract in full conformity with the specifications, drawings or samples, if any and shall if operable, operate properly. This warranty shall expire (except in respect of complaints notified to the contractor prior to such date) twelve months after the date of receipt of the last lot of stores under the contract at the ultimate destination stipulated in the contract.

34.2 For a period of twelve calendar months after the plant/ machinery/equipment/instruments has been put into operation (or a suitable mutually agreed longer period to be reckoned from the date of last major shipment depending upon the nature of the plant/machinery/equipment/instrument) the Contractor shall be responsible for any defects that may develop under conditions provided for the contract and under proper use, arising from the faulty materials, design or workmanship in the plant or from faulty erection of the plant by the Contractor, but otherwise and shall rectify such defects at his own cost when called upon to do so by the Purchaser who shall state in writing such defects.

34.3 If it becomes necessary for the Contractor to replace or renew any defective portions of the plant for purpose of rectification under this clause, the provisions of this clause shall apply to the portions of the plant so replaced or renewed under the expiration of six months from the date of such replacement or renewal or until the end of the above mentioned period of twelve months whichever may be the later. If any defects not rectified within reasonable time, the purchaser may proceed to get the work done at contractor's risk and expenses but without prejudice to any other rights which the Purchaser may have against the Contractor in respect of such defects as provided in clause 9.2.4 or 9.2.5.

34.4 All inspections adjustments, replacements or renewals carried out Contractor during the warranty period shall be subject to the same conditions as in the contract.

34.5 Contractor shall, spare parts of equipment before going out of production, give adequate advance notice to the purchaser so that the latter may order requirement of spares in one lot if so desires.

34.6 The contractor shall further guarantee that if spare parts go out of production, will make available blue prints, drawings of spare parts and specifications of material at no cost to the Purchaser, if and when required in connection with the equipment to enable Purchaser to fabricate or procure spare parts from other sources.

34.7 The provision of this clause shall remain effective and binding upon the Contractor even after the completion or expiration of the contract and till the plant/machinery/equipment supplied under the contract is in use by the Purchaser.

35. MODE OF PAYMENT

35.1 Unless otherwise agreed to in writing between the Purchaser and the Contractor, payment for the delivery of the material will be made as follows.

Within 30 days from the date of final acceptance and on receipt of Performance Bank guarantee for 10% of the contract value amount from SBI/nationalized banks or any one of the scheduled banks mentioned in the bracket (Axis Bank, HDFC Bank, ICICI Bank and IDBI Bank) valid through out the guarantee period mentioned in the contract/purchase order.

35.1.1 In case any of the vendors seek advance or progressive payment prior to delivery of the material, such requests can be considered only in exceptional cases of large value items, in which case the vendor will be required to furnish a bank guarantee for an equivalent amount of the advance/progressive payment sought for, valid till the execution of the contract. The bank guarantee shall be got executed as per the Purchaser's format from the State Bank of India (SBI)/nationalized banks or any one of the scheduled banks mentioned in the bracket (Axis Bank, HDFC Bank, ICICI Bank and IDBI Bank).

35.1.2 Besides, the offers of the vendors seeking advance/progressive payment will be evaluated by loading 12% interest charges per annum on the amount of advance desired up to the delivery period quoted.

35.1.3 In case any of the vendors seek pro-rata payment for the stores to be supplied they should clearly mention in their offer the maximum number of installments of supply. However, such installment delivery and pro-rata payment will be considered only in respect of contract involving large value and sizeable quantity of the item and the maximum number of installments shall be normally restricted to four. Acceptance or otherwise of this condition is reserved by the purchaser.

35.1.4 **Bank Charges:** All bank charges to be borne by the Contractor/Supplier.

35.1.5 No correspondence will be entertained within 30 days from the date of receipt of material and bills, whichever is later.

35.1.6 **Interest for delay in supply beyond the contractual delivery date:** Wherever advance payments are sought for by the contractor and

admitted in the contract, against Bank Guarantee for equivalent amount, in the event of any delay in supply beyond the contractual delivery date for reasons attributable to the contractor, interest charges @ 12% shall be levied for the period beyond the contractual delivery date, on the amount of balance advance payment to be adjusted.

36. DELAY IN ERECTION

36.1 Wherever erection of a plant or machinery is the responsibility of the Contractor as a term of the contract and in case the Contractor fails to carry out the erection as and when called upon as to do within the period specified by the Purchaser, the Purchaser shall have right to get the erection done through any source of his choice. In such an event, the contractor shall be liable to bear any additional expenditure that the Purchaser may incur towards erection. The Contractor shall, however, not be entitled to any gain due to such an action by the Purchaser.

SECTION 'C'

TECHNICAL SPECIFICATIONS OF STORES AND DRAWINGS

Please refer tender document

SECTION ‘D’

FORMAT FOR SUBMISSION OF PART-II (PRICE)

Please refer tender document

DEFERRED TERMS

TENDER FORM

प्लाज्मा अनुसंधान संस्थान

(भारत सरकार के परमाणु ऊर्जा विभाग का सहायता प्राप्त संस्थान)

इंदीरा ब्रिज के पास, भाट, गांधीनगर – 382428, भारत

दूरभाष: 079-23962020/23962021, **फैक्स:** 079-23962277

Following terms are **replaced** in our Form for Tender No. **IPR/TN/PUR/TPT/ET/21-22/037** dated **30-12-2021**.

1) Sr.No.3 (Sub-clause No. 3.1) of Section-A under heading **"Earnest Money Deposit (EMD)"** of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:

Earnest Money Deposit (EMD) is not applicable as per Office Memorandum No. F.9/4/2020-PPD dated 12/11/2020 issued by Ministry of Finance, Department of Expenditure, Procurement Policy Division, Government of India. In place of submission of EMD, vendor may upload a signed **"Bid Security Declaration"** as per the attached **Annexure-V** accepting that if they withdraw or modify their bids during the period of validity etc., they will be suspended for future requirements of IPR.

2) Sr. No. 15.3 (Section-A) under heading **"TENDERING CONDITIONS FOR BIDS"** of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:
Quotation/ offer should be on FOR, IPR Gandhinagar basis only. Quotation/offer received in any other terms/ conditions shall not be considered.

3) Sr. No. 15.6 (Section-A) under heading **"TENDERING CONDITIONS FOR BIDS"** of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is deleted

4) Sr.No.18 (Section-A) under heading **"Statutory Levies such as Customs Duty, Goods and Service Tax"** of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:

Clause Nos.18.1, 18.2, 18.3, 18.5.2 and its sub-clauses deleted from Form No: IPR-LP-ET-02.V5.

5) Sr. No. 46 (Section-A) under heading "**Price/Purchase Preference"** of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:
Purchase/Price preference: Purchase/Price preference benefits under MSME/NSIC including benefits under PPP-Make India policy will be provided to the industries as per the policies of the Government

of India in force at the time of evaluation of the offers provided their offer is in compliance with the terms and conditions of the tender.

6) Sr. No. 4.1 (Section-B) under heading **"Security Deposit"** of "General Conditions of Contract of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:

On acceptance of tender, the Contractor shall at the option of the Purchaser and within the period specified by him, submit a Bank Guarantee from State Bank of India or any Indian Nationalized/ Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks) on a non-judicial stamp paper of appropriate value towards Security Deposit not exceeding **3% (three percent)** of the tendered value of the contract/purchase order valid till at least 2 months beyond the acceptance date of the material, as the Purchaser shall specify. Bank Guarantees submitted other than from banks approved by IPR will not be accepted.

7) (a) Sr. No. 15.1 (Section-B) under heading **"Performance Bank Guarantee"** of "General Conditions of Contract of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:

In the event of acceptance of the tender, the Contractor will be required to submit a performance bank guarantee for **3% of the total value of the stores inclusive of all statutory levies and other charges** admitted in the contract, from State Bank of India or any Indian Nationalized/ Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks), on a non-judicial stamp paper of appropriate value valid till 2 months beyond the expiry date of warranty period as per the Purchaser's format towards satisfactory performance of the Stores during the warranty period. Bank Guarantees submitted other than from banks approved by IPR will not be accepted.

8) Sr. No. 22.1 (Section-B) under heading **Liquidated Damages** of "General Conditions of Contract" of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:

Liquidated Damages: As per Standard Terms & conditions, the Purchaser reserves the right to levy the Liquidated Damages, for delay in **completion period beyond the contractual completion date at the rate of half percent (0.5 percent) of the total Contract price (Basic price of item sr.no. 1.01 to 1.04)** for each calendar week of delay. **GST @ 18% will be applicable on LD charges**. The total liquidated damages shall not exceed five percent (5%) of the contract price (Basic price). Stores/Goods will be deemed to have been delivered only when all its component parts are also delivered. If certain components are not delivered in time, the Stores/Goods will be

considered as delayed until such time as the missing parts are delivered.

9) Sr. No. 34.2 (Section-B) under heading "Warranty of "General Conditions of Contract" of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:

Warranty:

36 months from the date of acceptance against all sorts of manufacturing defects, faulty materials and poor workmanship.

10) Sr. No. 35 (Section-B) under heading Mode of Payment of "General Conditions of Contract" of Form No.IPR-LP-ET-02.V5 (Terms and Conditions) is replaced with the following:

Payment: Unless otherwise agreed to in writing between the Purchaser and the Contractor, payment for the delivery of the tendered items, will be made as follows.

a) 80% of basic price of Item Sr. No. 1, 2, 3, 4 and 5 of Price-Schedule +100% of all other charges pertaining to Item sr.no.1, 2, 3, 4 and 5 of Price-Schedule will be paid after delivery at IPR, Gandhinagar Site, its physical verification by representative of IPR and on receipt of Invoice in triplicate.

b) Balance 20% of basic price of Item Sr.No. 1, 2, 3, 4 and 5 of Price-Schedule and 100% of Item Sr. No. 6 of Price-Schedule will be paid within 30 days after testing and final acceptance of the system at IPR Site, on receipt of Performance Bank Guarantee for 3% of the order value inclusive of all statutory levies and other charges from State Bank of India or any Indian Nationalized/Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks), on a non-judicial stamp paper of appropriate value valid throughout the warranty period **(Plus additional 2 months grace period)** and on receipt of final invoice**.**

IMPORTANT NOTE:

(a) Installation, testing & Commissioning charges (if applicable) should be inclusive of loading, unloading at IPR site, shifting, handling with accessories)

(b) Detailed specifications and scope of work are as per Section-C of tender document.

(c) If the rate cells are left blank, it will be treated as "0" (ZERO)

(d) Custom Duty Exemption certificate will not be issued to any bidder

under any circumstances.

(e) Prices as per bid format are only acceptable

(f) GST (IGST, CGST, SGST or any form) should not be included in the basic cost (Unit Rate Column) for either goods or services.

(g) Evaluated total cost on the basis of bid prices will be calculated by Purchaser after bid opening.

(h) HSN/SAC Code: For indigenous goods/services, to be filled by the bidder

Following **ADDITIONAL CLAUSES** are **added to** our Form No. IPR-LP-ET 02.V5 for Tender No. **IPR/TN/PUR/TPT/ET/21-22/037** dated **30-12-2021**.

1. MAKE IN INDIA

i. As defined under the Public Procurement (Preference to Make in India), order 2017, Revised order dated: 16/09/2020 or as being revised from time to time, in procurement of goods or services in respect of which the Nodal Ministry/Department has communicated, that there is sufficient local capacity and local competition, only "Class-I local supplier', as defined under the said order, shall be eligible to bid irrespective of purchase value.

ii. Only "Class-I local supplier" and "Class-II local supplier', as defined under the above said order, shall be eligible to bid in procurements under taken by this Institute, except where the mode of procurement is by issue of Global Tender Enquiry. The bidding supplier shall indicate the percentage of local content for the item being offered in their bid.

iii. Where the procurement is by issue of Global Tender enquiry, Non local suppliers, shall also be eligible to bid along with "Class-I local suppliers and Class-II local suppliers". Suppliers/bidders offering imported products will fall under the category of Non-local suppliers.

iv. Subject to the provisions of the above said order, and to any specific instructions issued by the Nodal Ministry or in pursuance of the said order, purchase preference shall be given to "Class-I local Suppliers" in procurements under taken by this Institute, in the manner specified there in the order.

v. The bidders along with their bid/tender shall be required to provide a self-declaration certificate of the local content (where the procurement value is Rs.10 Crore or less) for the item offered and their status as Class-I/Class-II/Non-Local supplier and their eligibility to participate in the tender. In cases of procurement for a value in excess of Rs.10 crores, the "Class-I local supplier'/'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost

accountant or practicing chartered accountant (in respect of Contractors other than companies) giving the percentage of local content.

vi. Self-declaration certificate should quantify the percentage of local content of the offered product only. It should also indicate the location. However, claiming the services such as transportation, insurance, installation & commissioning, training and after sale service support like AMC/CMC etc., shall not be considered as local content as per OM N.P-45021/102/2019-BE-II-Part(1)(E- 50310) dated:4/03/2021 issued by Ministry of Commerce and Industry, DPIIT.

vii. False declarations/violation of this order terms shall be deemed to be breach of code of integrity resulting in debarment of the firm for a period up to 2 years. Under such circumstances, the supplier shall not be considered for any preferences as proposed in the order.

viii. Wherever the bids are received without accompanying the above said requisite certificate such offers shall be treated as incomplete and not considered.

ix. Bidders/contractor are divided into three categories based on Local Content (The total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent):

1. Class-I local supplier is with local content equal to or more than as prescribed by the Nodal Ministry/ NIT, if prescribed, for the item being procured or 50% whichever is higher.

2. Class-II Local supplier is with local content equal to or more than as prescribed by the Nodal Ministry/NIT, if prescribed, for the item being procured or 20% whichever is higher, but less than that applicable for class-I local supplier.

3. Non-local supplier is with local content less than that applicable to class-II local supplier, as stated above.

Note: Where the estimated value of the procurement is less than Rs.5 Lakhs (or as being amended by the competent authority from time to time) is exempted from the provisions of the above Make in India policy as stated therein the order.

Self-certification under preference to "Make in India" order as per **Annexure-I** should be uploaded on e-tender portal along with other documents.

2. ELIGIBILITY OF BIDDERS FROM SPECIFIED COUNTRIES:

i. Orders issued by the Government of India restricting

procurement from bidders of certain countries which shares a land border with India shall apply to this procurement.

ii. Any bidder from a country which shares a land border with India (https://mea.gov.in/india-and- neighnours.htm), excluding countries as listed in the website of Ministry of External Affairs (https://meadashbaord.gov.in/indicators/92), to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects – hereinafter called "Restricted countries') shall be eligible to bid in this tender only if the bidder is registered (https://dipp.gov.in/sites/default/files/Revised-Application-Format-for-Registration- of-Bidders-15Oct2020.pdf) with the Registration committee constituted by the Department for promotion of Industry and Internal Trade(DPIIT) . The bidders shall enclose valid registration certificate along with their offer. Wherever the bids are received without accompanying the above said requisite certificate such offers shall be treated as incomplete and not considered.

Self-certification under **ELIGIBILITY DECLARATIONS FROM SPECIFIED COUNTRIES** order as per **Annexure-II** should be uploaded on e-tender portal along with other documents.

3. **UNDERTAKING:** Acceptance of tender condition as per **Annexure-III** should be uploaded on e-tender portal along with other documents.

4. **CODE OF INTEGRITY**

No official of a procuring entity or bidder or contractor shall act in contravention ofthe codes which include

(i) Prohibition of
   (a) making offer, solicitation or acceptance of bribe, reward or gift or any material benefit, either directly or indirectly, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process.
   (b) any omission, or misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained or an obligation avoided.
   (c) any collusion, bid rigging or anticompetitive behavior that may impair the transparency, fairness and the progress of the procurement process.
   (d) improper use of information provided by the procuring entity to the bidder with an intent to gain unfair advantage in the procurement process or for personal gain.

(e) any financial or business transactions between the bidder and any official of the procuring entity related to tender or execution process of contract; which can affect the decision of the procuring entity directly or indirectly any coercion or any threat to impair or harm, directly or indirectly, any party or its property to influence the procurement process.

(f) obstruction of any investigation or auditing of a procurement process.

(g) making false declaration or providing false information for participation in a tender process or to secure a contract;

(ii) Disclosure of conflict of interest.

(iii) Disclosure by the bidder of any previous transgressions made in respect of the provisions of sub-clause (i) with any entity in any country during the last three years or of being debarred by any other procuring entity.

(iv) Institute for Plasma Research, after giving a reasonable opportunity of being heard, comes to the conclusion that a bidder or prospective bidder, as the case may be, has contravened the code of integrity, may take appropriate measures as deemed fit, including rejecting his bid and forfeiting EMD and/or debarring him from participating in future bidding.

5. **Commercial Bid (Unpriced)** : Vendor/ Bidder should upload the duly filled (signed and stamped) copy of commercial bid(unpriced) as per Annexure-IV

6. **TDS as per CGST Act**: As per the provisions mentioned under Section No. 51 of the CGST Act 2017, TDS @ 2% (IGST 2% or CGST 1% and SGST 1%) will be deducted while making payment to the suppliers where total value of the purchase order/contracts/work orders exceeds Rs.2.5 Lakhs. Necessary TDS Certificate will be issued to the supplier after TDS deduction.

IMPORTANT NOTE:

[1] QUOTATIONS ARE INVITED IN INDIAN CURRENCY ONLY.

[2] QUOTATIONS RECEIVED OTHER THAN "INR" QUOTE SHALL SUMMARILY BE REJECTED.

(To be printed in letter head)

ANNEXURE-I

Self-Certification under preference to Make in India order Certificate

In line with Government Public Procurement Order No. P-45021/2/2017-PP (BE-II) dated 04.06.2020 and its amendments, we hereby certify that we M/s. _____ are local supplier meeting the requirement of minimum local content i.e., _____% excluding transportation, insurance, installation, commissioning, testing, training and after sales service support like AMC/CMC etc. as defined in above orders for the material against **IPR Enquiry/Tender No. IPR/TN/PUR/TPT/ET/21-22/037 DATED 30-12-2021** Details of location at which local value addition will be made as follows: _____.

We also understand, false declarations will be in breach of the code of integrity under rule 175(1) (i) (h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Thanking You,

_____

Signature with date:

Name:

Designation:

Official Seal

ANNEXURE-II

Annexure to Bid Form: Eligibility Declaration

(To be submitted as part of tender/Technical Bid)
(On company letter head)
(Along with supporting documents, if any)

Tender No: **IPR/TN/PUR/TPT/ET/21-22/037 dated 30-12-2021**
Tender Tile: **Supply, Installation, development and Commissioning of Process Automation System for Large Volume Plasma Device Upgrade (LVPD-U) at Institute for Plasma Research, Gandhinagar as per the detailed specifications mentioned in the tender documents.**

Bidder's Name: _____
(Address and contact details)
Bidder's Offer No._____ Date:_____

Restrictions on procurement from Bidders from a country or countries, or class of countries under Rule 144(xi) of the General Financial Rules 2017.

"We have read the clause regarding restrictions on procurement from Bidder of a country which shares a land border with India; and solemnly certify that we are not from such a country or, if from such country, we are registered with the Competent Authority (copy enclosed). We hereby certify that we fulfill all requirements in this regard and are eligible to be considered."

Penalties for false or misleading declarations:

We hereby confirm that the particulars given above are factually correct and nothing is concealed and also undertake to advise any further changes to the above details. We understood that any wrong or misleading self-declaration by us would be violation of Code of integrity and would attract penalties as mentioned in this tender document, including debarment.

_____
(Signature with date)

_____
(Name and designation)
Duly authorized to sign Bid for and on behalf of

_____
(Name & address of the Bidder and Seal of Company)

(This need to be printed in Tenderer's letter head)

Annexure-III

Undertaking

To,

The Purchase Officer
Institute for Plasma Research
Near Indira Bridge
Bhat
Gandhinagar-382428 (INDIA),

Ref: Tender Notice No. IPR/TN/PUR/TPT/ET/21-22/037 dated **30-12-2021**

Dear Sir,

I / We have gone through the tendering conditions pertaining to the Two Part Tender and General Conditions of Contracts and Special Conditions of Contracts contained in Section "B" of Form No: IPR-LP-ET-02.V5. I/We hereby agree to supply the stores conforming to the tender specifications and also agree to abide by your General Conditions of all Contracts and Special Conditions of Contract contained in Section "B" of the Tender document.

- You will be at liberty to accept any one or more of the items of stores offered by us and I/We shall be bound to supply you the stores as may be specified in the Purchase Order/Contract.
- I/We hereby agree to keep the price valid for your acceptance for a period of 120 days from the date of opening of the tender.
- Deviations to technical specifications of the tender documents are detailed in Annexure-A of the tender form while deviations proposed to the General/Special Conditions of Contract are detailed in Annexure "B" to this tender.
- Standard equipments / accessories included in the bids shall be procured from OEM or their authorised agents. Any of the offered standard bought out equipment is not refurbished.
- I/We have also uploaded all the leaflets / catalogue, etc. pertaining to the stores offered.

Yours faithfully

Stamp and Signature of the Tenderer

Institute for Plasma Research
(An Aided Institute of Dept. of Atomic Energy)
Bhat, Gandhinagar

Annexure - IV

IPR Enquiry NO & Date	**IPR/TN/PUR/TPT/ET/21-22/037 DATED 30-12-2021**

COMMERCIAL TERMS & CONDITIONS

ITEM DESCRIPTION	**Supply, Installation, development and Commissioning of Process Automation System for Large Volume Plasma Device Upgrade (LVPD-U) at Institute for Plasma Research, Gandhinagar as per the detailed specifications mentioned in the tender documents.**

Sl. No.	PARTICULARS	REMARKS
I	**Name of the Bidder**	
II	**Bidder Offer No. & Date**	
III	**Postal address**	
IV	**Contact No. with STD Code**	
V	**Fax with STD Code**	
VI	**Name of Contact person**	
VII	**Mobile No.**	
VIII	**E-mail ID**	
IX	**Currency of offer/quotation**	INR
	Commercial Terms for Quoted items (Please Provide Commercial terms and conditions in the below form)	
1	Confirm the offered Price shall be firm and fixed through out the currency of contract, in the event of placement of purchase order.	
2	Price Term:	FOR IPR Gandhinagar
3	**Goods and Services Tax**: **Goods and Service Tax <u>for Supply Items</u> only**: IPR is entitled to avail GST Concessional Rate as per Ministry of Finance Notification No. 47/2017 Integrated Tax (Rate) dated 14/11/17 (for IGST) and (CGST @ 2.5% and SGST @ 2.5%) as per Notification No. 45/2017-Central Tax (Rate) dated 14/11/17 and Notification No. 45/2017-State Tax (Rate) dated 15/11/17 **Confirm that in the event of issuence of GST Concessional Certificate you shall charge GST on Supply Portion @5% only** **Goods and Service Tax for Service items: As applicable**	
4	**COMPLETION PERIOD: Refer Tender Document.**	

5	**Installation and commissioning charges :** Have you offered Installation & Commissioning Charges? **(if applicable)**	
6	**Liquidated Damages**:- Please confirm that the Liquidated Damages as per Sr. No. 22 of Section B of Form No IPR-LP-ET-02.V5 (Terms and Conditions) attached with the tender/enquiry is acceptable to you	
7	Terms of Payment:- as per Sr. No. 35 of Section B of Form No. IPR-LP-ET-02.V5 (Terms and Conditions) attached with the tender/enquiry. (Also refer document named "Deferred_terms_IPR-LP-ET-02.V5" for amended terms)	
8	Guaranty / Warranty:-as per Sr. No. 34 of Section B of Form No. IPR-LP-ET-02.V5 (Terms and Conditions) attached with the tender/enquiry. (Also refer document named "Deferred_terms_IPR-LP-ET-02.V5" for amended terms)	
9	**Validity of offer/quotation**:- Refer tender terms	
	QUESTIONNAIRE TO BE FILLED BY BIDDER IN AND SENT ALONG WITH OFFER DULY SIGNED	
10	In the event of a purchase order/contract vendor has to provide Security Deposit in the form of Bank Guarantee for 3% of contract/ order value from State Bank of India or any Indian Nationalized/ Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks) on a non-judicial stamp paper of appropriate value valid till at least 2 months beyond the final acceptance of the supplied goods at IPR, wherever applicable shall be submitted .	
11	In the event of a purchase order/contract Performance Bank Guarantee for 3% of the contract/order value from State Bank of India or any Indian Nationalized/ Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks) on a non-judicial stamp paper of appropriate value till 2 months beyond the expiry date of warranty period , wherever applicable shall be submitted.	
12	I/We hereby offer to supply the stores detailed in the schedule hereto at the price given in the said schedule and agree to hold this offer open till expiry of quotation. I/We shall be bound to supply the stores hereby offered upon issue of purchase order communicating the acceptance thereof on or before the expiry of the last mentioned date. You will be at liberty to accept any one or more of the items of stores tendered for or portion of any or more of the items of such stores and I/We notwithstanding that the offer in the tender has not been accepted in whole shall be bound to supply to you- such item or items and such portion or portions of one or more of the items as may be specified in the said Purchase Order communicating the acceptance.	
13	Whether All Documents Related to tender Viewed?	
14	Vendor should upload the complete technical details (Technical specifications with product data sheet	
15	**Free Issue Material:** Successful tenderer will have to arrange insurance showing beneficiary as “Institute for Plasma Research” at their risk and cost towards adequate security for the materials/property provided/issued by the Purchaser as Free Issue Material for the due execution of the contract, wherever applicable.	

(To be printed in letter head)

ANNEXURE-V

BID SECURITY DECLARATION

IN LIEU OF SUBMISSION OF EARNEST MONEY DEPOSIT (EMD)

Ref: (1) Our Offer No. ..... dated .....

(2) Your Tender No. IPR/TN/PUR/TPT/ET/21-22/037 dated **30-12-2021**

In the event of withdrawing or modifying our offer within the validity or extended validity period, we hereby accept the suspension of our company for a period of two years from the date publication of this tender for your future requirement.

_____

Signature with date:

Name:

Designation:

Official Seal

SECTION ‘C’
TECHNICAL SPECIFICATIONS
OF
STORES AND DRAWINGS

Institute for Plasma Research

(An Aided Institute of Dept. of Atomic Energy)
Bhat, Gandhinagar

Eligibility Criteria (Annexure-A)

ITEM DESCRIPTION	**Supply, Installation, development and Commissioning of Process Automation System for Large Volume Plasma Device Upgrade (LVPD-U) at Institute for Plasma Research, Gandhinagar as per the detailed specifications mentioned in the tender documents.**

Sr. No.	Detailed Criteria	Documents required to submit / upload
1	Should have supplied at least three PLC based SCADA solutions with 150 I/O to the industry in last 5 years from the date of publication of the tender.	Bidder should upload copies of Purchase order/s with technical specification, name of client (with name, email id & contact no. of concerned engineer/officer of the client for reference), and documentary proof of acceptance/installation/performance certificate from end user.

Note:

a	The response to tender without submission of proof of above points will summarily be rejected without further communication
b	The bidder shall not be under a declaration of ineligibility for corrupt or fraudulent practices or blacklisted with any of the Government agencies
c	Original documents shall be produced for verifications, if required

Technical Specifications

Development, Supply, Installation, and Commissioning of Process Automation System for Large Volume Plasma Device Upgrade (LVPD-U)

Contents

Introduction

The machine control system for the Large Volume Plasma Device Upgrade (LVPD-U) is required for the safe, protected and controlled operation of the device. The LVPD-U has advanced from LVPD and during the transition, has aimed for fivefold increase in discharge time (~ 50ms) and an order enhancement in plasma density (~10^{12}/cc). In order to attain these requirements, the device has enhanced its various subsystems. It has added three high current power supplies (1kA/150V, 2.5kA/175V and 10kA/20V), a large plasma source (ϕ=1.8 m and capable of catering 20kW of power for feeding current to its 162 filaments), 120 number of signals from magnet coils (300A/400V for 150G operation) and temperature signals producing thermal profile of the plasma source besides adding LabVIEW interfaced operation of 12 linear probe drives (each of travel length 100 cm). The LVPD-U is operated in pulsed mode for the pulse duration of, Δt=50ms in single pulse and burst mode of operations (burst of 8 pulses) with repetition rate of 1 second. The device has switched from conventional manual mode of operations (LVPD) to automated operation of its various subsystems. Over an operational life of one and a half decade, the device has undergone many operational changes. In the first decade of its operation, the functioning of its subsystems was restricted primarily to the manual mode, which was time consuming and cumbersome. In the later part, with the switchover to automation and with the inception of Large Area Multi-filamentary Plasma Source (LAMPS), integration of pulsed, high current discharge and electron energy filter power supplies, along with DC high current filament power supply, the controlled operation has become a necessity. The nature of investigations of both active and passive nature and with several requirements on controls during various plasma operations coming in, necessitates automated mode of operation. In the background of this, a system for automated startup and shutdown of LVPD-U has been configured. The system requirement document and specifications for the required system has been finalized and subsequently its tender has been raised. The specifications cover end to end solution ranging right from signal end to data visualization over PC. We expect that with this development, the operational feasibility of plasma discharges and safety norms will streamline LVPD-U operations. This will not only allow increased frequency of plasma investigations but also, more importantly will ensure safety of the machine and make it operationally a user's friendly machine. The operation cycle of LVPD-U has been broadly classified into three sequences: (i) Startup sequence to bring system into ready for plasma discharge state, (ii) Plasma sequence for plasma discharge and characterization, and (iii) Shutdown sequence for safe and graceful shutdown of the device. The operational details are described in Appendix M Description of control logic. Out of the below listed three sequences, only Start and Shutdown Sequences are being addressed in this tender. The transition of operation of LVPD-U to Process Automation System (PAS) will greatly help users to address multiple physics issues of concern simultaneously and further it will improve the operational efficiency of the device.

Objective and scope of the work

The tender laid down the technical specifications for the procurement of proposed process automation system for safe and protected operation of the devices with minimal human intervention. The deliverable product of this tender is end to

end integrated solution for operation of the machine for the mentioned Startup and Shutdown sequences. The vendor is responsible for providing turnkey solution over the specifications provided by IPR. The scope is better illustrated by Figure 1 and Appendix A .

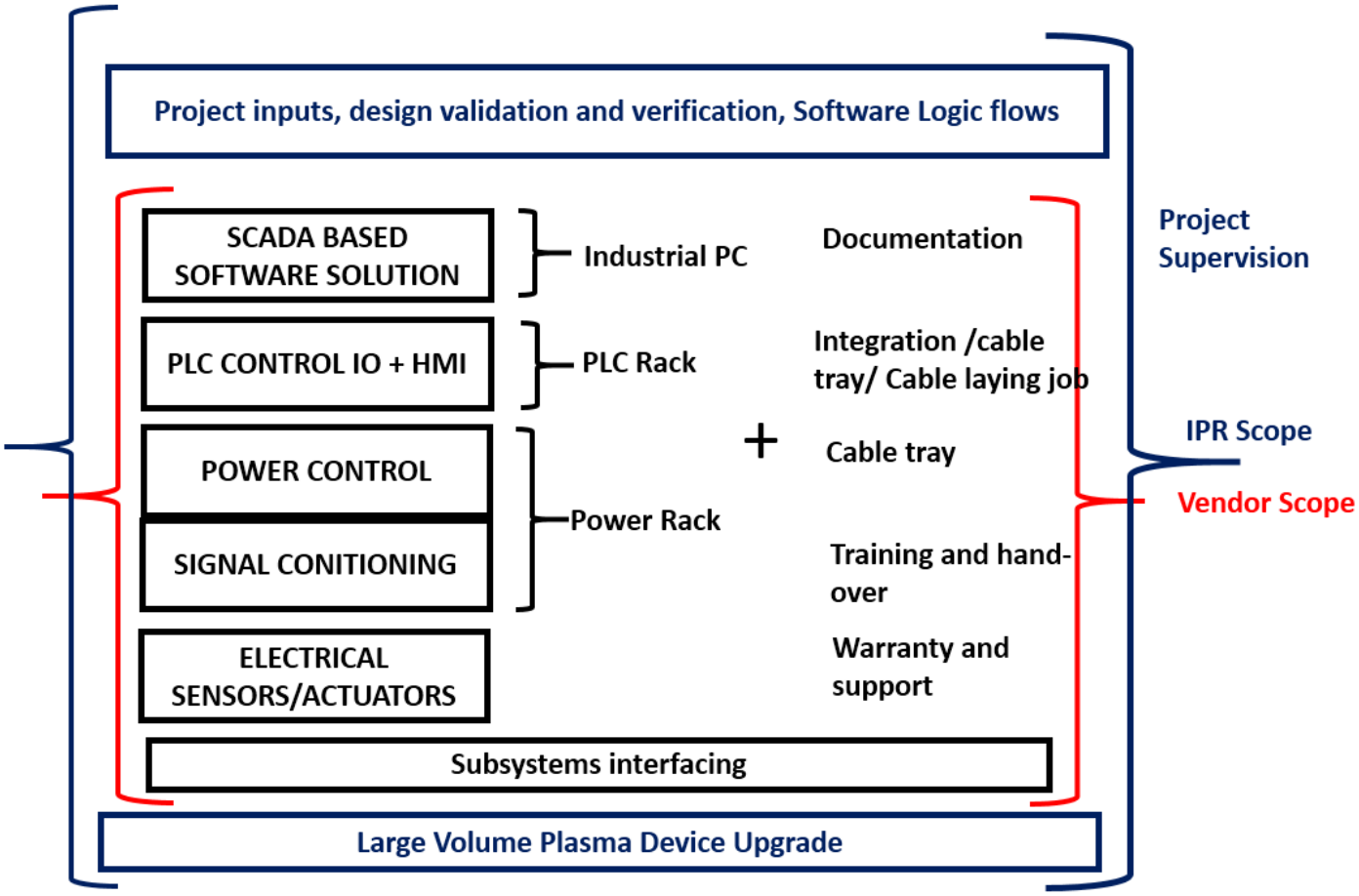

Figure 1 The scope of the tender is described in terms of vendor and IPR responsibilities, IPR will provides required infrastructure and permission for interfacing, the interfacing with the subsystem and integrated testing will be responsibility of vendor

Scope of LVPD (IPR): LVPD team will provide the signal and interface information of various subsystems to the vendor and broader guidelines for selection of process automation system components. The signals are described here and vendor has to submit the information in the required format. IPR will facilitate required permissions for installations and commissioning. IPR will approve various design drawings and will supervise the overall development.

Scope of Supplier: The supplier will provide end to end solution from sensors to PC as per mentioned scope, which includes supply of (A) Electrical measurement and control components, (B) Control cubical or racks, (C) Industrial PC, (D) Software development, (E) Documentation and Training, and (F) Spares.

Bid submission guidelines

1. Vendor should submit the bid strictly in the prescribed format as mentioned in the attached appendixes. The conformance to the IPR specification should be mentioned as Yes or No and additional points/suggestion should strictly submitted in the column named as the vendor's additional comments. Bids not submitted in the prescribed format will leads to disqualification. Please avoid the ambiguous words and statement in the bid which will lead to disqualification or additional communication as per relevant purchase procedures. If the supplied items have higher or lower specifications than it should be clearly mentioned in the vendor's additional comments column. Please use numbers rather than using relative words such as better/higher/comparative.
2. The web links for detailed specification sheet and relevant manuals should be submitted to avoid un-necessary, duplicate queries and communications. Vendor should properly fill all the columns and should not leave any column empty. The places where information is not matching the specification, it should be clearly mentioned. If any clarification on the given specifications are required then it should be clarified before submission of the bid. The incomplete bids will be rejected and no communication with the party will be carried out.
3. The supplied Bill of material should match the specifications. The vendors should verify this important step at their end before submission of the bid. The specifications are given in the generalized format to encourage the bid by multiple vendors. The vendor should produce the test and calibration certificate of the procured items against the Purchase Order, a necessary condition of the bid. The items should be purchased within a year from the date of supply.
4. In case of software items, Latest means the latest released compatible version.

Warranty and Support Services

1. The bidder is responsible for ensuring warranty and support for all the items specified in the tender. The bidder should provide warranty for the period of 3 years from the date of acceptance for all hardware and software items. Vendor should attend and rectify the hardware breakdown or software malfunction during the warranty period.
2. The bidder should provide calibration certificates not more than 6 month old from the date of supply.
3. The training of PLC Hardware and software solution should be provided for 15 day for two nominated IPR persons.

Appendix A Scope of the tender

	Stages	IPR Scope	Vendor Scope	Vendor Compliance (Yes/No)	Vendor's additional comments
1	Design documents	Inputs, discussions, approval and supervision.	1. Software design document. 2. High level hardware and interfacing documents having electrical diagrams, instrumentation diagrams, control and interface documentation, cable laying and tagging schema.		
2	Development	Supervision and discussions	1. Code of the PLC side programs for startup and shutdown sequences. 2. Code of the PC side programs for operational control and visualization of startup and shutdown sequence. 3. Code for visualization on HMI.		
3	Implementation	Interfacing support and required permissions.	1. Testing report of the integrated operational scenarios. 2. Integration schema documents. 3. Jobs: Sensors/ Transducer installation, cable tray laying, end to end cabling and labeling solutions.		
4	Calibration certificates and Handover		1. Handover documents such as user and programmer manuals with common fault scenario handling. 2. Calibration certificates and relevant documents		

Appendix B Bill of Materials

	Vendor Scope	Vendor Confirmation (Yes/No)	Vendors additional comments
1.	Electrical components as mentioned in Appendix J List of mandatory electrical components as per Appendix K List of mandatory spares to cover the signals I/O mentioned in Appendix L Signal List .		
2.	Industrial grade 19" Rack named as Power Rack for housing of power components. [Quantity: 1 No.]		
3.	Industrial grade 19" Rack named as Control Rack for housing of PLC modules, termination blocks and other accessories. [Quantity: 1 No.]		
4.	Integration of electrical component, cable tray laying and end-to-end cabling solution. [Qunatity:1 Job work]		
5.	19" HMI as per specifications. It should be mounted on Control rack. [Quantity: 1 No.]		
6.	Rack mountable Industrial PC. [Quantity: 1 No.]		
7.	Software code as per approved design.		
8.	SCADA [1 License] and PLC programming Software [1 License].		
9.	PLC hardware system suitable for 150 signals I/O handling (as mentioned in Appendix L Signal List). [1 Lot.]		

Note: A contact person, responsible for handling of project execution for all deliverables, should be allocated and specified in the bid.

Appendix C Proposed timeline for project execution

	Proposed Task list	Proposed Timelines	Vendor Confirmation (Yes/No)	Vendor's Additional Remark
T0.	Issue of Purchase order	T0		
T1.	Design documents preparation and finalization (as per mentioned scope in Appendix A)	T0+6 weeks		
T2.	Procurement and preliminary testing of the hardware and software components (as mentioned in Appendix B Bill of Materials)	T1+8 weeks		
T3.	Development and preliminary testing of PC and PLC software	T2+6 weeks		
T4.	Integrated testing of PLC and PC software with emulated signals and test scenarios	T3+8 weeks		
T5.	Factory Acceptance Test	T4+2 week		
T6.	Delivery and installation at IPR – Cable tray, cabling, wiring, end to end interfacing of all components.	T5+8 weeks		
T7.	Comprehensive testing with LVPD system, Documentation and Final handover.	T6+8 weeks		
	Total	T0+52 weeks		

Note: Vendor should have sufficient number of hardware sources and sinks for integrated testing for emulating signals and scenarios. In case of any timelines issues, please mention in the additional remark column.

Appendix D Specifications of the SCADA Software

	Parameters	IPR Specifications	Vendors Compliance (Yes/No)	Vendor Additional Remarks
1	Make/Model/Version	To be specified	NA	
2	Datasheet/ Programmer and User Manuals	Please provide web link of the manuals		
3	Software compatibility	Should be compatible with PLC programming software.		
4		Should be compatible with the operating system loaded in the industrial PC.		
5	Number of licenses	One		
6	Software features	Integrated SCADA development environment, Context aware workspace, Graphical configuration editor for hardware and software process variables.		
7	Alarm management	Seamless integrated alarming, trending, interlock and control data together in single interface, Alarm zone for alarm summaries and facility of alarm shelving		
8	Process variable handling	Process variable creation and handling tools, 1500 PV		
9	Equipment libraries	Comprehensive Equipment library consist of controls, valves, drives, motor, data and UI elements, 2D and 3D visualization etc.		
10	OPC Interface	Should have included OPC interfacing mechanism/libraries to tunnel PV to LabVIEW.		
11	Deployment	Should be installed on Industrial PC.		

Appendix E Specifications of the PLC Programming Software

	Parameters	IPR Specifications	Vendors Compliance (Yes/No)	Vendor Additional Remarks
1.	Make/Model/Version	To be specified by vendor	NA	
2.	Datasheet / Programmer / User Manuals	Submit web link of the request manuals attached.		
3.	Software compatibility	Should be compatible with provided SCADA solution.		
4.		Should be compatible with the operating system of the industrial PC.		
5.	Software features	Integrated project management tools		
6.		Should provide programming blocks to program in Ladder logic, Function block diagram, and SCL.		
7.		Should provide tools to define and manage different type of data blocks/function blocks.		
8.		Should also provide facility of the Diagnostic viewer, Project diagnostics, and documentation.		
9.		Should provide PLC simulation facility.		
10.		Should provide the comprehensive data handling libraries, serial and relevant communication libraries as per IEC 61131 standard.		
11.	Deployment	Should be installed on Industrial PC.		

Appendix F Specifications of the HMI

		IPR Specifications	Vendors Compliance (Yes/No)	Vendor‘s Remark / Comment
1.	Make/Model	To be specified by vendor	NA	
2.	Datasheet / Programmer and User Manuals	Please attach web link of the data sheet and manuals.		
3.	Compatibility	Should be compatible with the PLC Software.		
4.		Software should be compatible with the operating system loaded in the industrial PC.		
5.	Size	19 inch or higher		
6.	Mounting	Should be mounted on the PLC panel.		
7.	Color	Color TFT LCD.		
8.	Colors	16 million colors or more		
9.	Type	Touch panel		
10.	Resolution	1366x768 or higher		
11.	Backlight lifespan	50,000 Hours		
12.	Supply voltage	12..24 V		

Appendix G Specifications of the Industrial PC

	IPR Specification		Vendors Compliance (Yes/No)	Vendor's additional Remark
1	Form factor	4U Rack mounted (horizontal)		
2	Mounting kit	Mounting hardware should be provided for housing in 19" standard rack.		
3	Datasheet/Manual	Provide datasheets/Manual links.		
4	CPU specifications	Dual CPU, 4 core per CPU, 64 bit architecture, Intel Xenon latest processor family, 8M cache or higher		
5	Motherboard	Intel Chipset, PCI /PCIe slot (3 numbers), USB port (4 Nos.), RS232 (2 Nos.), RS485 (4 Nos.), Keyboard/Mouse port,		
6	RAM	32 GB or higher		
7	HDD Total Size	4 TB , RAID 5 configured		
8	Network port	2 RJ45 network port of 1 Gbps speed (Appropriate length network cable should be provided for testing and interfacing).		
9	Power supply	Redundant power supplies.		
10	Operating System	Window latest Operating System.		
11	Accessories	Keyboard and mouse with mouse pad.		

Note: The industrial PC will provide the user interface for operation of the LVPD device using interactive controls. It will be housed in the LVPD control room and will be having the license version of PLC programming software and SCADA software along with developed software during execution of the tender.

Appendix H Integration job work, cabling and laying

The cable tray laying will be carried out in an area of 15m x 12 m as per given schema. A tentative schema is described in Figure 2. The installation of the Cables and Cable tray is the responsibility of the vendor. The current schema is tentative and will be discussed, finalized and approved before final integration.

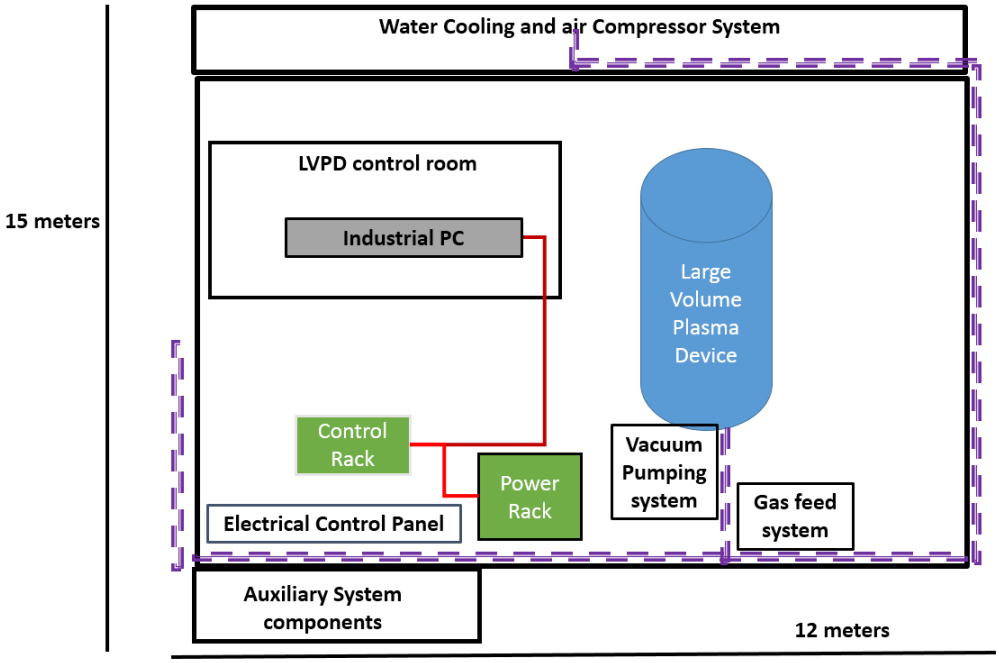

Figure 2 In this diagram, purple color lines show the tentative cable tray path and location of Control, Power rack and Industrial PC.

	IPR Specifications	Vendors Compliance (Yes/No)	Vendor's additional Remark
	Cable Tray		
1	The LVPD has existing cable tray for routing of the cable. The new cable tray will be laid along with the existing cable tray and support structure of the existing cable tray will be used wherever needed and minor civil work (if needed) should be done by vendor without an additional cost.		
2	The cable tray will be mostly closed type, Al cable tray where routing is straight and will be flexible type (PVC) near the vacuum pumping system.		
3	All cable tray components should have appropriate BIS mark.		
4	The cabling tray drawing and routing schema should be prepared by supplier and should be approved by IPR before installation. The supplier can use junction box as required for reducing the number of cables.		
	Cabling		

5	The wiring job includes all interfacing cable laying from load-end to PC end. The end to end cabling is the responsibility of the vendor. It is recommended to have multi-core cables as far as possible to reduce maintenance cost in the field. The 2-core, 4-core cable should be used as required for internal wiring inside the rack.		
6	All cable should have appropriate BIS mark.		
7	The cabling schema and drawing (inside and outside racks) should be prepared by supplier and should be approved by IPR before installation. All the cable should have tagging at source, termination and at multiple places in between for the long cable. The wiring should be such that all cables should be properly insulated and Quality of PVC tag should also be ensured.		
	Power and Control rack wiring		
8	The appropriate rating cables and connector should be used and proper distance between components should be maintained. The appropriate color code and cables of suitable color should be used for easy identification. The cables between PLC modules and termination block should have proper tags as per schema agreed and approved by IPR and vendor.		
	Sensor/Transducers installations		
9	The electrical measurement and control components includes sensor and actuator devices with required interfacing hardware for measurement and control of load end devices/systems. The load end specifications are supplied so that vendor can have flexibility of customization. The required protections and fitting accessories should be provided.		
10	The signal list is provided for various subsystems or units along with broader technical specifications and type of electrical sensor/actuators to be procured. It is the responsibility of the vendor to check the compatibility between load and control end. If some conversions is required then that conversion hardware should be supplied as part of procurement without any additional cost. The detail data sheet of the supplied sensors/actuator should be submitted while bidding.		
11	All the electrical sensors and actuators should be supplied and if any interface/convertor/civil/mechanical/plumbing items or work is required for interfacing with the system then it must be arranged by the supplier without any additional cost.		
12	All the electrical sensors and actuators should have appropriate BIS mark.		
	All power switching components (relays and contactors) should be modular for		

	easy replacement in case of failure.		
	Power Rack for housing of power and power distribution components		
13	Rack dimensions: Width:19", Height:6m, Depth:1000mm, Wheels at the base with two brakes, Front and rear access		
14	Should have appropriate internal rails for mounting of components, internal power sockets and cable laying arrangements. The power rack houses power and distribution components.		
15	IPR will provide 415 V, 3Φ wall outlet for input power and subsequent power distribution has to be carried out by supplier. The internal distribution of power using appropriate rating MCBs and to various components should be performed by vendor as per agreed schema.		
16	The rack should be of standard BIS standard.		
	Control Rack		
17	Rack dimensions: Width:19", Height:6m, Depth:1000mm, Wheels at the base with two brakes, Front and rear access		
18	19" rack of appropriate internal rails for mounting of PLC modules, termination blocks, signal conditioning with power sockets and cable tray for laying of cables. It will be used for all control components house-keeping and installation.		
19	The HMI will be mounted on the field on the control cubical for facilitating local operation.		
20	The internal components installations inside the control rack is the responsibility of the vendor and before-hand, it should be agreed and approved by IPR.		
21	The rack should have standard BIS mark.		

Appendix I Specification of the PLC system and architecture

PLC system architecture:

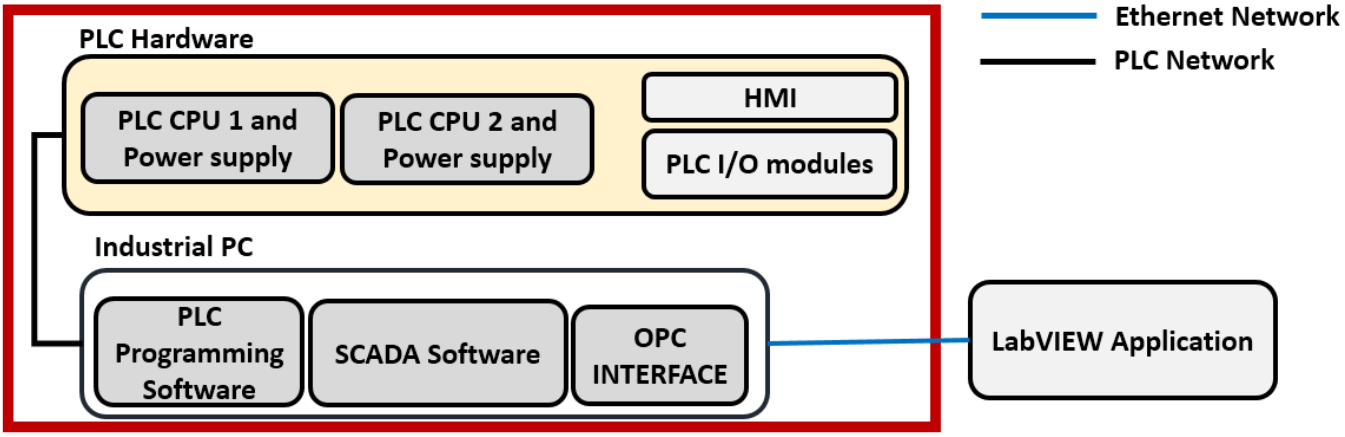

Figure 3 It specify the logical architecture where vendor scope is specified by Red box and the selected process variables should be exportable using OPC interface to the LabVIEW. The SCADA software provides the local visualization capability and user operation capabilities. The PLC architecture have redundant CPUs where second CPU is in hot standby modes and takes the control during failure of the first CPU/error. The PLC modules are as per the specified signal list and are connected to PLC CPU using appropriate communication droplets.

PLC system specifications

	IPR Specifications	Vendors Compliance (Yes/No)	Vendor additional Remark
	PLC CPU		
1	The two CPUs and associated power supplies, backplane rails should be supplied. CPU should be in hot redundant configuration. The hot standby link and CPU accessories should be provided.		
2	Vendor should mention CPU and power supply make and model number.		
3	PLC hardware should be detectable and configurable using supplied software solutions.		
4	PLC CPU should provide application specific I/O, timers and counter, accurate time stamping, serial link, programmable loops, 1st Ethernet TCP/IP for service port, 2nd Ethernet TCP/IP for device network, USB type mini B, 1 Ethernet for HSBY port, suitable number of remote I/O stations, RIO Scanner, DIO Scanner, Expandable RAM, 4 GB for data storage, 8 MB for program, 7.5 Kinst/ms or higher.		
	PLC modules		

5	The PLC modules (AI, AO, DI, and DO) should be selected such that the required signal interfacing (160 I/O) should be covered. The hardware modules should be selected such that the number of cards should be minimum.		
6	The required communication modules should be selected such that the minimum two Ethernet droplets can be drawn.		
	Termination blocks		
7	The termination panels for each PLC module and required connector cables should be supplied.		

Appendix J List of mandatory electrical components

List of electrical components (specification and interfacing details are as mentioned in Appendix L)

	Instruments	Spare quantity	Vendor confirmation (Yes/No)	Vendor additional remark
	Current transformer			
1	0-10A AC, 0-10VDC output with isolator	3		
	Contactors			
2	3Φ, 5.5 kW and accessories	1		
3	3Φ, 1.1 kW and accessories	4		
4	3Φ, 7.5 kW and accessories	1		
5	3Φ, 2.5 kw and accessories	3		
6	3Φ, 19 kW and accessories	1		
	PFC points			
7	PFC input and accessories	16		
8	DPDT relay and accessories (DOL Contractor, 3 Φ [12]; DOL Contractor, 1 Φ [18])	30		
9	Power monitoring relays and accessories	3		
10	Controlled Service board and accessories	7		
	Flow Meter			
11	0-150 lpm, corrosion resistant, 4-20 mA and accessories	6		
12	0-300 lpm, corrosion resistant, 4-20 mA and accessories	3		
	Temperature sensor and accessories			
13	PT100 isolated and accessories	17		
	Level sensors			
14	Ultrasonic, corrosion resistant, 1.5m tank height and accessories	2		
	Pressure transducer			
15	0-10 bar, 4-20 mA and accessories	7		
16	0-10 V signal conditioning electronic of mentioned AI signals	10		

Appendix K List of mandatory spares

	Instruments	Spare quantity	Vendor confirmation (Yes/No)	Vendor additional remark
	Current transformer			
1	0-10A AC, 0-10VDC output with isolator	2		
	Contactors			
2	3Φ, 5.5 kW and accessories	1		
3	3Φ, 1.1 kW and accessories	2		
4	3Φ, 7.5 kW and accessories	1		
5	3Φ, 2.5 kw and accessories	1		
6	3Φ, 19 kW and accessories	1		
	PFC points			
7	PFC input and accessories	6		
8	DPDT relay and accessories	10		
9	Power monitoring relays and accessories	1		
10	Controlled Service board and accessories	3		
	Flow Meter			
11	0-150 lpm, corrosion resistant, 4-20 mA and accessories	2		
12	0-300 lpm, corrosion resistant, 4-20 mA and accessories	2		
	Temperature sensor and accessories			
13	PT100 isolated and accessories	5		
	Level sensors			
14	Ultrasonic, corrosion resistant, 1.5m tank height and accessories	1		
	Pressure transducer			
15	0-10 bar, 4-20 mA and accessories	3		
16	0-10 V signal conditioning electronic of mentioned AI signals	4		

PLC hardware

1	DI module and accessories (16 channels)	1		
2	DO module and accessories (16 channels)	1		
3	AI module and accessories (16 Channels)	1		
4	TC/RTD module and accessories (16 Channels)	1		

Appendix L Signal List

Signal List Summary

		DI	DO	AI	RTD
	Auxiliary System ready process				
1	Air Compressor		1	1	1
2	Industrial DM water cooler	2	8		1
3	Industrial DM water pumps		4	2	
4	Cooling System			13	15
5	Solenoid Pneumatic Valve		10		
	Vacuum production process				
1	Interspace vacuum pumping		2		
2	Rough vacuum pumping	2	3		
3	High vacuum pumping	12	12	6	
4	Gauges	2	3	6	
	Gas feed process				
1	Automatic pressure and Mass flow controller, RGA	3	4	1	
	Sub-total	21	47	29	17
	Total	114			
	Spare signals considered	8	19	13	5
	Total	159			

Note:

1. The signals are detailed out with required electrical components here. Total number of signals are 114. With spares we have considered 160 signals. Therefore, the chosen PLC hardware and software solution must provide facility to interface these signals. SCADA software solution should provide facility to process 1500 PVs.
2. Galvanic isolation for all the analog signals/transmitters is to be ensured with isolation amplifier modules of 1000V AC/DC of higher isolation before connection to PLC AI hardware.

Detailed signal list

Process Loop Name: Auxiliary System Ready

Process Loop type: Continuous

Purpose: Set the relevant cooling and pressure condition by auxiliary system startup/Shutdown

Required information note: Vendor should mention the supplied component make and model number along with web link of the datasheet for all the below mentioned electrical components at the time of bid submission. Vendor should also provide the calibration certificate for the all instruments component after PO.

Unit Number 01		**Air Compressor [Electrical specifications: 5.5 kW, 7.6 HP induction motor, 11.2 Amp/Φ, 3Φ AC motor]**			
	Signal Name	**IPR Specification**	**Type**	**Vendor compliance (Yes/No)**	**Vendor's additional remarks**
1	Air compressor Start/Stop	DC Relay based contract free output for DOL Contractor control (3 Phase) NC = Start, NO = Stop. Vendor should supply MPCB, Contractor, Add on contact, Power cable, Double compression MOC should be supplied. (All Signals and Switching cables should be Shielded twisted pairs. Any other changes like bunching etc be proposed has to be first taken approval from the users). A clear cable tagging plan for all types of cables should be discussed as per layout scheme with the user and approved before actual implementations.	DO		
2	Air Compressor pressure transducer	Air Pressure transducer in the range of 0-10 bar should be supplied by the vendor and appropriate input voltage should be connected to the AI module after proper signal conditioning and galvanic isolation. Pressure transmitter, fitting accessories, instrumentation cable, double compression MOC should be supplied. Galvanic isolation for all the Analog signal modules is expected to be ensured with isolation amplifier modules with more than 1000V AC/DC isolation.	AI		
3	Air Compressor cooling water temperature	Temperature transducer (TT) in the range of 0-100 degree centigrade should be provided by the vendor and appropriate input voltage should be connected to the AI module after proper signal conditioning and galvanic isolation. RTD (PT100) with	AI		

		head mount TT, fitting, instrumentation cable, Double compression MOC should be supplied.			
Unit number 02		**Industrial DM water cooler [Electrical specifications: 40 KVA, 3 phase AC motor]**			
4	Water temperature	Temperature transducer in the range of 0-100 degree centigrade should be provided by the vendor and appropriate input voltage should be connected to the AI module after proper signal conditioning and galvanic isolation. RTD PT100 with head mount TT, fitting, instrumentation cable, Double compression MOC should be supplied.	AI		
5	Water level sensor status 1 and Status 2	Water level transducer for the existing tank of height 1.5m should be provides with required accessories. The appropriate input voltage should be connected to the AI module after proper signal conditioning and galvanic isolation. The sensor should be corrosion resistant and should provide ultrasonic based detection mechanism. Level switch side mounted, fittings, control cable, double compression MOC should be provided by vendor.	AI (2Nos)		
6	Compressor and Blower 1 Start	DC Relay based contract free output for 3 phase DOL Contractor (NO, Pulsed trigger to NC) should be provided. Control cable, Double Compression MOC and required accessories should be provided.	DO (2Nos)		
7	Compressor and Blower 1 Stop	DC Relay based contract free output for 3 phase DOL Contractor (NC, Pulsed trigger to NO) should be provided. Control cable, Double Compression MOC and required accessories should be provided.	DO (2Nos)		
8	Compressor and Blower 2 Start	DC Relay based contract free output for 3 phase DOL Contractor (NO, Pulsed trigger to NC) should be provided. Control cable, Double Compression MOC and required accessories should be provided.	DO (2Nos)		
9	Compressor and Blower 2 Stop	DC Relay based contract free output for 3 phase DOL Contractor (NC, Pulsed trigger to NO) should be provided. Control cable, Double Compression MOC and required accessories should be provided.	DO (2Nos)		
Unit number 03		**Industrial DM water pumps [Electrical specifications: 1 kVA, 2 Amp/phase, 3 phase AC motor]**			

10	Water pump 1 Start	DC Relay based contract free output for 3 phase DOL Contractor (NO, Pulsed trigger to NC) should be provided. Control cable, Double Compression MOC and required accessories should be provided.	DO		
11	Water pump 1 Stop	DC Relay based contract free output for 3 phase DOL Contractor (NC, Pulsed trigger to NO) should be provided. Control cable, Double Compression MOC and required accessories should be provided.	DO		
12	Water pump 2 Start	DC Relay based contract free output for 3 phase DOL Contractor (NO, Pulsed trigger to NC) should be provided. Control cable, Double Compression GLAND and required accessories should be provided.	DO		
13	Water pump 2 Stop	DC Relay based contract free output for 3 phase DOL Contractor (NC, Pulsed trigger to NO) should be provided. Control cable, Double Compression GLAND and required accessories should be provided.	DO		
14	Pressure monitoring in water pump 1 and water pump 2	Water Pressure transducer in the range of 0-10 bar should be supplied by the vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. Pressure transmitter, fittings, double compression Gland should be supplied.	AI (2 Nos.)		
Unit number 04		**Cooling System**			
15	Filament power supply cooling water inlet pressure	Water Pressure transducer in the range of 0-10 bar should be supplied and installed by the vendor and appropriate input voltage should be connected to AI module after proper signal conditioning and galvanic isolation. The required interface should be managed by the party by incorporating right piping and feed though hardware. Pressure transmitter, fitting accessories, instrumentation cable, double compression GLAND should be supplied.	AI		
16	Filament power supply cooling water temperature	Temperature transducer in the range of 0-100 degree centigrade should be supplied by vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. RTD PT100 with head mount TT, fitting,	AI		

		instrumentation cable, Double compression GLAND should be supplied.			
17	Filament power supply cooling water flow	Water flow transducer which can measure 0-300 lpm should be supplied vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. The sensor should be corrosion resistant. Flow transmitter (vortex/turbine type), fittings, instrumentation cable and cable accessories should be supplied.	AI		
18	Device cooling inlet Pressure	Water Pressure transducer in the range of 0-10 bar should be supplied and installed by the vendor and appropriate input voltage should be connected to AI module after proper signal conditioning and galvanic isolation. The required interface should be managed by the party by incorporating right piping and feed though hardware. Pressure transmitter, fitting accessories, instrumentation cable, double compression GLAND should be supplied.	AI		
19	Device cooling inlet temperature	Temperature transduce in the range of 0-100 degree centigrade should be supplied by vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. RTD PT100 with head mount TT, fitting, instrumentation cable, Double compression GLAND should be supplied.	AI		
20	Device cooling flow	Water flow transducer which can measure 0-300 lpm should be supplied vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. The sensor should be corrosion resistant. Flow transmitter (vortex/turbine type), fittings, instrumentation cable and cable accessories should be supplied.	AI		
21	Magnet cooling inlet Pressure	Water Pressure transducer in the range of 0-10 bar should be supplied and installed by the vendor and appropriate input voltage should be connected to AI module after proper signal conditioning and galvanic isolation. The required interface should be managed by the party by incorporating right piping and feed though hardware. Pressure transmitter, fitting accessories, instrumentation cable, double compression GLAND	AI		

		should be supplied.			
22	Magnet cooling inlet temperature	Temperature transduce in the range of 0-100 degree centigrade should be supplied by vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. RTD PT100 with head mount TT, fitting, instrumentation cable, Double compression GLAND should be supplied.	AI		
23	Magnet cooling flow	Water flow transducer which can measure 0-300 lpm should be supplied vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. The sensor should be corrosion resistant. Flow transmitter (vortex/turbine type), fittings, instrumentation cable and cable accessories should be supplied	AI		
24	Cathode cooling inlet Pressure	Water Pressure transducer in the range of 0-10 bar should be supplied and installed by the vendor and appropriate input voltage should be connected to AI module after proper signal conditioning and galvanic isolation. The required interface should be managed by the party by incorporating right piping and feed though hardware. Pressure transmitter, fitting accessories, instrumentation cable, double compression GLAND should be supplied.	AI		
25	Cathode cooling inlet temperature (8 locations of cathode and 4 location of Anode)	Temperature transduce in the range of 0-100 degree centigrade should be supplied by vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. RTD PT100 with head mount TT, fitting, instrumentation cable, Double compression GLAND should be supplied.	AI (12 Nos.)		
26	Cathode cooling flow measurement (at 6 locations)	Water flow transducer which can measure 0-150 lpm should be supplied vendor and appropriate input voltage should be connected the AI module after proper signal conditioning and galvanic isolation. The sensor should be corrosion resistant. Flow transmitter (vortex/turbine type), fittings, instrumentation cable and cable accessories should be supplied.	AI (6 Nos.)		

Unit number 05		Pneumatic valves			
27	Solenoid pneumatic valve for Rotary Pump 01	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided	DO		
28	Solenoid pneumatic valve for Rotary Pump 02	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided	DO		
29	Solenoid pneumatic valve for Rotary Pump 03	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided	DO		
29	Solenoid based 5-port pneumatic valve for baffle valve of Diffusion Pump 1 (Air)	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided	DO		
30	Solenoid based 5-port pneumatic valve for baffle valve of Diffusion Pump 2 (Air)	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided	DO		
31	Solenoid based 5-port pneumatic valve for baffle valve control of Diffusion Pump 3 (Air)	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided.	DO		
32	Solenoid based 5-port pneumatic valve for Gate Valve 1	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided.	DO		
33	Solenoid based 5-port	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop,	DO		

	pneumatic valve for Gate Valve 2	Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided.			
34	Solenoid pneumatic valve for Liquid N2 pressurized line (Dewar)	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided.	DO		
35	Solenoid valve Extra for pneumatic control.	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Control cable and double compression GLAND should be provided.	DO		
Process loop Name: Vacuum production process **Process loop type:** Continuous **Purpose:** Production of vacuum using orchestration of various pumps **Note:** Vendor should mention the supplied component make and model number along with web link of the datasheet for all the below mentioned electrical components at the time of bid submission. Vendor should also provide the calibration certificate for the all instruments component after PO.					
Unit number 01		**Interspace vacuum pump**			
36	Interspace Rotary Pump Power Start/Stop	DC Relay based AC Power Control to AC contactor coils; 1.1 kW, NC = Start, NO = Stop, Relay and single phase contactor should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		
37	Interspace backing valve Power Start/Stop	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be Supplied by Vendor. Double Compression GLAND and control cable should be supplied.	DO		
Unit number 02		**Rough Vacuum Pumping**			
38	Rotary of root pump start/stop	DC Relay based AC Power Control to AC contactor coils; 19 kW, NC = Start, NO = Stop, Relay and 3 phase contactors should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		

39	Root pump Start /Stop	DC Relay based AC Power Control to AC contactor coils; 7.5 kW, NC = Start, NO = Stop, Relay and 3 phase contactors should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied	DO		
40	Gate valve Start/Stop (Solenoid based 5-port pneumatic valve)	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be supplied by Vendor. Double Compression GLAND and control cable should be supplied.	DO		
41	Gate valve Close status detection	PFC points, NC and switch over to NO when activated using source current from PLC power supply.	DI		
42	Gate valve Open status detection	PFC points, NO and switch over to NC when activated using source current from PLC power supply.	DI		
Unit number 03		**High vacuum pumping**			
43	Rotary pump 1 Start/Stop	DC Relay based AC Power Control to AC contactor coils; 1.1 kW, NC = Start, NO = Stop, Relay and 3 phase contactor should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		
44	Rotary pump 2 Start/Stop	DC Relay based AC Power Control to AC contactor coils; 1.1 kW, NC = Start, NO = Stop, Relay and 3 phase contactor should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		
45	Rotary pump 3 Start/Stop	DC Relay based AC Power Control to AC contactor coils; 1.1 kW, NC = Start, NO = Stop, Relay and 3 phase contactor should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		
46	Diffusion Pump 1 Heater Start/Stop	DC Relay based AC Power Control to AC contactor coils; 2.5 kW, NC = Start, NO = Stop, Relay and 3 phase contactor should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		
47	Diffusion Pump 2 Heater Start/Stop	DC Relay based AC Power Control to AC contactor coils; 2.5 kW, NC = Start, NO = Stop, Relay and 3 phase contactor should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		

48	Diffusion Pump 3 Heater Start/Stop	DC Relay based AC Power Control to AC contactor coils; 2.5 kW, NC = Start, NO = Stop, Relay and 3 phase contactor should be Supplied by Vendor. MPCB, Contactor, Add on contact, power cable, Double compression GLAND should be supplied.	DO		
49	Diffusion Pump 1 Baffle valve Start/Stop	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be supplied by Vendor along with control cable.	DO		
50	Diffusion Pump 2 Baffle valve Start/Stop	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be supplied by Vendor along with control cable.	DO		
51	Diffusion Pump 3 Baffle valve Start/Stop	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be supplied by Vendor along with control cable.	DO		
52	Diffusion Pump 1 Baffle valve Open/close status detection	PFC points, NC and switch over to NO when activated using source current from PLC power supply along with control cables.	DI		
53	Diffusion Pump 2 Baffle valve Open/close status detection	PFC points, NC and switch over to NO when activated using source current from PLC power supply along with control cables.	DI		
54	Diffusion Pump 3 Baffle valve Open/close status detection	PFC points, NC and switch over to NO when activated using source current from PLC power supply along with control cables.	DI		
55	Diffusion Pump 1 backing valve Start/Stop	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be supplied by Vendor along with control cable.	DO		
56	Diffusion Pump 2 backing valve	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be supplied by Vendor along with control cable.	DO		

	Start/Stop				
57	Diffusion Pump 3 backing valve Start/Stop	DC Relay based AC Power Control to 1-Phase solenoid coils; NC = Start, NO = Stop, Relay should be supplied by Vendor along with control cable.	DO		
58	Diffusion Pump 1 backing valve Open/close status detection	PFC points, NC and switch over to NO when activated using source current from PLC power supply along with control cables.	DI		
59	Diffusion Pump 2 backing valve Open/close status detection	PFC points, NC and switch over to NO when activated using source current from PLC power supply along with control cables.	DI		
60	Diffusion Pump 3 backing valve Open/close status detection	PFC points, NC and switch over to NO when activated using source current from PLC power supply along with control cables.	DI		
61	Diffusion pump 1 Pirani gauge for pressure readout	0-10 V analog input from the gauge head metering unit should be connected to suitable AI module with galvanic isolation and proper signal conditioning and PTFE shielded twisted pair cables.	AI		
62	Diffusion pump 2 Pirani gauge for pressure readout	0-10 V analog input from the gauge head metering unit should be connected to suitable AI module with galvanic isolation and proper signal conditioning and PTFE shielded twisted pair cables..	AI		
63	Diffusion pump 3 Pirani gauge for pressure readout	0-10 V analog input from the gauge head metering unit should be connected to suitable AI module with galvanic isolation and proper signal conditioning and PTFE shielded twisted pair cables..	AI		
64	Diffusion pump 1	Single phase measurement of heater current using AC Current transformer based	AI		

	heater current readout	sensing is needed which is ranging from 0-10A. All signal conditioning as well as CT /Sensors should be supplied by vendor. Output should be scaled to 0-10V and this will be connected to analog input module of PLC with galvanic isolation. The suitable CT should be provided along with PTFE shielded twisted pair cables.			
65	Diffusion pump 2 heater current readout	Single phase measurement of heater current using AC Current transformer based sensing is needed which is ranging from 0-10A. All signal conditioning as well as CT /Sensors should be supplied by vendor. Output should be scaled to 0-10V and this will be connected to analog input module of PLC with galvanic isolation. The suitable CT should be provided along with PTFE shielded twisted pair cables.	AI		
66	Diffusion pump 3 heater current readout	Single phase measurement of heater current using AC Current transformer based sensing is needed which is ranging from 0-10A. All signal conditioning as well as CT /Sensors should be supplied by vendor. Output should be scaled to 0-10V and this will be connected to analog input module of PLC with galvanic isolation. The suitable CT should be provided along with PTFE shielded twisted pair cables.	AI		
67	Diffusion pump 1 thermal snap switch status	PFC points, NO and switch over to NC when activated using source current from PLC power supply along with control cables.	DI		
68	Diffusion pump 2 thermal snap switch status	PFC points, NO and switch over to NC when activated using source current from PLC power supply along with control cables.	DI		
69	Diffusion pump 3 thermal snap switch status	PFC points, NO and switch over to NC when activated using source current from PLC power supply along with control cables.	DI		
70	Diffusion pump 1 ready status	PFC points, NO and switch over to NC when activated using source current from PLC power supply along with control cables.	DI		
71	Diffusion pump 2	PFC points, NO and switch over to NC when activated using source current from PLC	DI		

	ready status	power supply along with control cables.			
72	Diffusion pump 3 ready status	PFC points, NO and switch over to NC when activated using source current from PLC power supply along with control cables.	DI		
Unit number 04		**Gauges**			
73	Interspace Pirani gauge Pressure readout	0-10 V analog input with galvanic isolation from the gauge head metering unit should be connected to suitable AI module after proper signal conditioning and PTFE shielded twisted pair cable.	AI		
74	Pirani gauge 1 Pressure readout	0-10 V analog input from the gauge head metering unit with galvanic isolation should be connected to suitable AI module after proper signal conditioning and PTFE shielded twisted pair cable.	AI		
75	Pirani gauge 2 Pressure readout	0-10 V analog input from the gauge head metering unit with galvanic isolation should be connected to suitable AI module after proper signal conditioning and PTFE shielded twisted pair cable.	AI		
76	Pirani Gauge 1 relay output (change-over)	PFC points, NO and switch over to NC when activated using source current from PLC power supply along with control cables.	DI		
77	Pirani Gauge 2 relay output (change-over)	PFC points, NO and switch over to NC when activated using source current from PLC power supply along with control cables.	DI		
78	Penning Gauge Power start/stop	Single phase AC Power supply control on an 19” rack mountable extension board though a contactor coil and DCs relays. The extension board should contains 1 number of 15/5A 3 pin socket and 4 numbers of 5A 3-pin sockets. An MCB with contactor be placed in the power rack for safety and in the field this 19” rack mountable power extension board be supplied with 20m 3 core 2.5sqmm power cable be supplied.	DO		
79	Penning Gauge pressure Readout	0-10 V analog input from the gauge head metering unit with galvanic isolation should be connected to suitable AI module after proper signal conditioning and PTFE shielded twisted pair cable.	AI		

80	Master Penning Gauge Power start/stop	Single phase AC Power supply control on a 19" rack mountable extension board though a contactor coil and DCs relays. The extension board should contains 1 number of 15/5A 3 pin socket and 4 numbers of 5A 3-pin sockets. An MCB with contactor be placed in the power rack for safety and in the field this 19" rack mountable power extension board be supplied with 20m 3 core 2.5sqmm power cable be supplied.	DO		
81	Master Penning Gauge pressure Readout	0-10 V analog input from the gauge head metering unit with galvanic isolation should be connected to suitable AI module after proper signal conditioning and PTFE shielded twisted pair cable.	AI		
82	Master ionization Gauge Power start/stop	Single phase AC Power supply control on a 19" rack mountable extension board though a contactor coil and DCs relays. The extension board should contains 1 number of 15/5A 3 pin socket and 4 numbers of 5A 3-pin sockets. An MCB with contactor be placed in the power rack for safety and in the field this 19" rack mountable power extension board be supplied with 20m 3 core 2.5sqmm power cable be supplied.	DO		
83	Master ionization Gauge pressure Readout	0-10 V analog input from the gauge head metering unit with galvanic isolation should be connected to suitable AI module after proper signal conditioning.	AI		
Process loop Name: Gas Feed process **Process loop type:** Continuous **Purpose:** Ar Gas feed into chamber for Ar plasma discharge **Note:** Vendor should mention the supplied component make and model number along with web link of the datasheet for all the below mentioned electrical components at the time of bid submission. Vendor should also provide the calibration certificate for the all instruments component after PO.					
Unit 01		**Automatic pressure controller**			
84	Argon pressure sensing (Low Pressure side)	Air Pressure transducer in the range of 0-10 bar should be supplied and installed by the vendor and appropriate input voltage should be connected to AI module after proper	AI		

		signal conditioning with galvanic isolation. The required interface should be managed by the party by incorporating right piping and feed though hardware. Pressure transmitter, fitting accessories, instrumentation cable, double compression MOC should be supplied.			
85	Automatic Pressure controller powering	Single phase AC Power supply control on a 19" rack mountable extension board though a contactor coil and DCs relays. The extension board should contains 1 number of 15/5A 3 pin socket and 4 numbers of 5A 3-pin sockets. An MCB with contactor be placed in the power rack for safety and in the field this 19" rack mountable power extension board be supplied with 20m 3 core 2.5sqmm power cable be supplied	DO		
86	Automatic Pressure controller power status	230 V AC power supply monitoring using any sensor presence of power supply using potential transformer etc. having isolated transfer of intelligence and rectified and conditioned digital output. Relay for power sensing, control cable and Double compression MOC should be supplied.	DI		
Unit 02		**Mass flow controller**			
87	Mass flow controller Powering Start/Stop	Single phase AC Power supply control on a 19" rack mountable extension board though a contactor coil and DCs relays. The extension board should contains 1 number of 15/5A 3 pin socket and 4 numbers of 5A 3-pin sockets. An MCB with contactor be placed in the power rack for safety and in the field this 19" rack mountable power extension board be supplied with 20m 3 core 2.5sqmm power cable be supplied	DO (2 Nos.)		
88	Mass flow controller Power status	230 V AC power supply monitoring using any sensor presence of power supply using potential transformer etc. having isolated transfer of intelligence and rectified and conditioned digital output. . Relay for power sensing, control cable and Double compression MOC should be supplied.	DI (2 Nos.)		
89	RGA power supply On/Off	Single phase AC Power supply control on a 19" rack mountable extension board though a contactor coil and DCs relays. The extension board should contains 1 number of 15/5A 3 pin socket and 4 numbers of 5A 3-pin sockets. An MCB with contactor be	DO		

		placed in the power rack for safety and in the field this 19" rack mountable power extension board be supplied with 20m 3 core 2.5sqmm power cable be supplied			
90	Experiment CCTV Power On/Off	Single phase AC Power supply control on a 19" rack mountable extension board though a contactor coil and DCs relays. The extension board should contains 1 number of 15/5A 3 pin socket and 4 numbers of 5A 3-pin sockets. An MCB with contactor be placed in the power rack for safety and in the field this 19" rack mountable power extension board be supplied with 20m 3 core 2.5sqmm power cable be supplied	DO		
PTFE: Poly tetra fluoro ethylene					

Appendix M Description of control logic

LVPD is a linear cylindrical shaped (L = 3m, and Φ=~2 m) experimental device at Institute for Plasma Research (IPR), India, dedicated for carrying out basic laboratory experiments for unfolding physical phenomenon happening in the wide ranges of plasmas ranging from Magnetosphere to Fusion plasmas. LVPD provides investigators an opportunity to produce and dress variety of the plasma inside the chamber simultaneously. Broadly, LVPD has three type of distinct plasma regions named as (i) Source, (ii) Target and (iii) Filter. There are only few such experimental systems existing across the globe, which are dedicated to unfolding physical phenomenon's of relevance to the variety of plasmas. The operation of the experiments in the LVPD is carried out by producing pulsed discharges, which means that plasma is created for a fraction of a second and lost thereafter. During the discharge duration, data acquisition is carried out using suitable diagnostics mechanism and analyzed. The repeatability of the discharge, provides statistical data for understanding of the plasma and spatial placing of the probes inside the vacuum chamber provides information of flow and transport characteristic of the plasma. The operation of the LVPD is described systematically by first classification of the number of involved sequences and secondly processes underneath each sequence. The operational sequences namely Startup sequence, Plasma Sequence and Shutdown sequence are described by Figure 4. The state based management is conceptualized for the changeover of the process of inside/outside sequences and debugging in case of an alarm raise due to any fault. The state diagram is described by Figure 5, which shows the state namely INITIALIZED, READY, SHUTDOWN and FAULT, and the logical flow of the sequences using change of state.

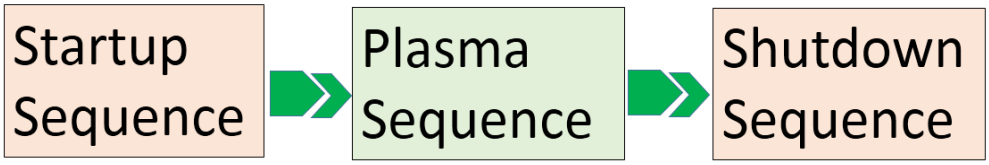

Figure 4 Operational sequences in the operation of Large Volume Plasma Device Upgrade, the startup and shutdown sequence are in scope of the tender. The pulse sequence is described for completeness.

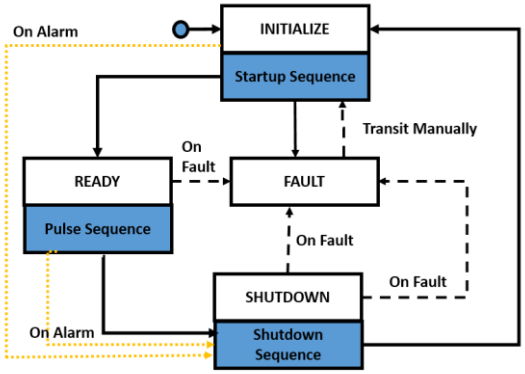

Figure 5 It represents the operation state diagram of the LVPD-U machine showing four states and three operational sequences. The black solid line shows the normal operational path, dashed lines shows the path which system takes in case of specified fault and dotted yellow lines, shows the path machine takes in case of specified alarm raise. The normal operation moves from INITIALIZED–

READY–SHUTDOWN-INITIALIZED path using three sequences and in case of fault signal from a sequence leads to shut-down and manual transition. The alarms are defined so that in case of crossover of the parameter limits, the safe and protected shutdown or recovery of the machine is ensured.

The description of the sequences are as follows:

1. **Startup sequence:** The process starts from closure of the vacuum chamber and involved subsystems operating under this sequence are dedicated to bring LVPD from INITIALIZED to READY state. The INITIALIZED state signifies the closed vacuum chamber and start of the operation and READY state signifies that vacuum is created and gas has been filled already for initiating Plasma discharge and diagnosis. It is a necessity that all the I&C system in the INITIALIZED state are healthy. It is a continuous control type sequence. After receiving alarms from LVPD subsystems, it moves to SHUTDOWN state. This process is to be implemented by the solutions in this tender. In this sequences, the selected Process variables data are exported by OPC interface for monitoring in and out during this process. This sequence is best specified by the timing diagram below:

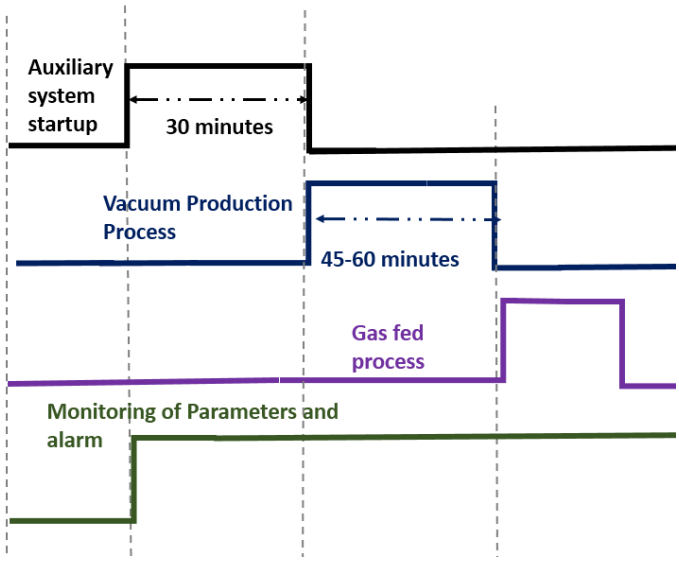

Figure 6 It specifies the startup sequence timing diagram consist of four processes namely (i) Auxiliary system startup process, (ii) Vacuum production process, (iii) Gas Fed process followed by continuous monitoring of parameters and alarms.

2. **Plasma sequence:** The processes and subsystems operating under this sequence are dedicated for plasma experiments. The plasma experiments are aimed for magnetized DC plasma operation for chamber cleaning or plasma discharges for investigation of physical phenomenons of relevant to magnetosphere and fusion plasmas. In this sequence, plasma is produced and experimental data is acquired by existing DAQ system. The switched activation of different power supplies produces magnetized or DC plasma. It provides single pulse or burst of pulses (8-10 pulses) for the required investigation of a physics phenomenon of interest. This is a discrete control type sequence. This process is not planned to be implemented in this tender and is described here for completeness.

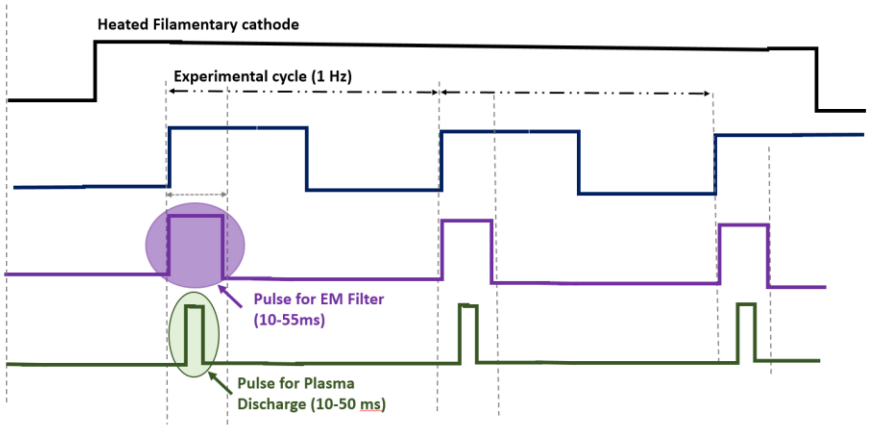

Figure 7 It specifies the pulsed sequence timing diagram which consist of filametary cathod heating cycle and pules given to EEF and DPS power supplies for dischage and filtering of the Plasma.

3. **Shutdown Sequence:** The processes and subsystems operating under this sequence are dedicated for safe and protected shutdown of activated system to bring system to INITIALIZED state again. In case of fault or alarm raise in the sequence, the system has to be manually put into INITIALIZED state. It is specified by FAULT state. This sequence is also executed conditionally based on the alarm state of all active systems. This process is to be implemented by the solution proposal in this tender. In this sequences, the selected Process variables are exported by OPC interface for monitoring in and during this process.

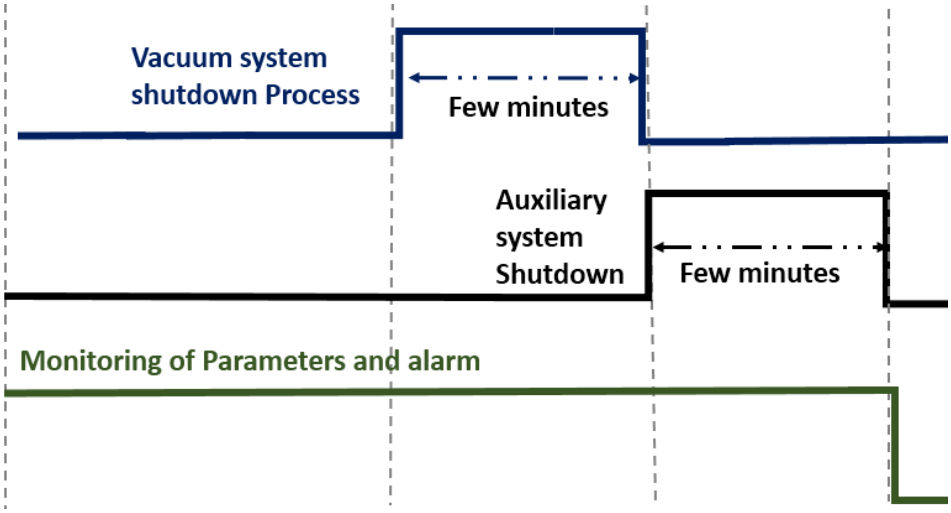

Figure 8 It describes the shutdown sequence of LVPD system operation.

Description of the Startup sequence

Auxiliaries Startup Sequence: The Plasma experiments involves control of high power in managing experimental operations that also involves various subsystem and vacuum chamber which requires certain operating pressure, temperature and cooling conditions. The cooling system provides the required DM water cooling so that wall temperature of the device, cathode assembly, high current power supplies such as magnets, filament, discharge and solenoid power

supplies remains below safe operating range. The safe operating condition for the device is <60°C and for Cathode is <100 °C. It is a continuous monitoring process and is executed throughout the daily operation session. The timing diagram of the auxiliaries' startup sequence is described by timing diagram below.

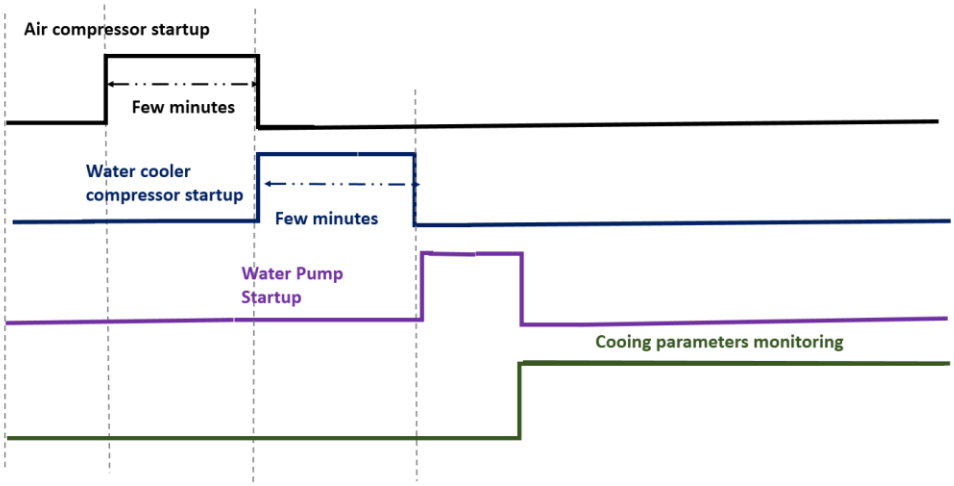

Figure 9 Timing diagram of the Auxiliaries startup sequence is described here.

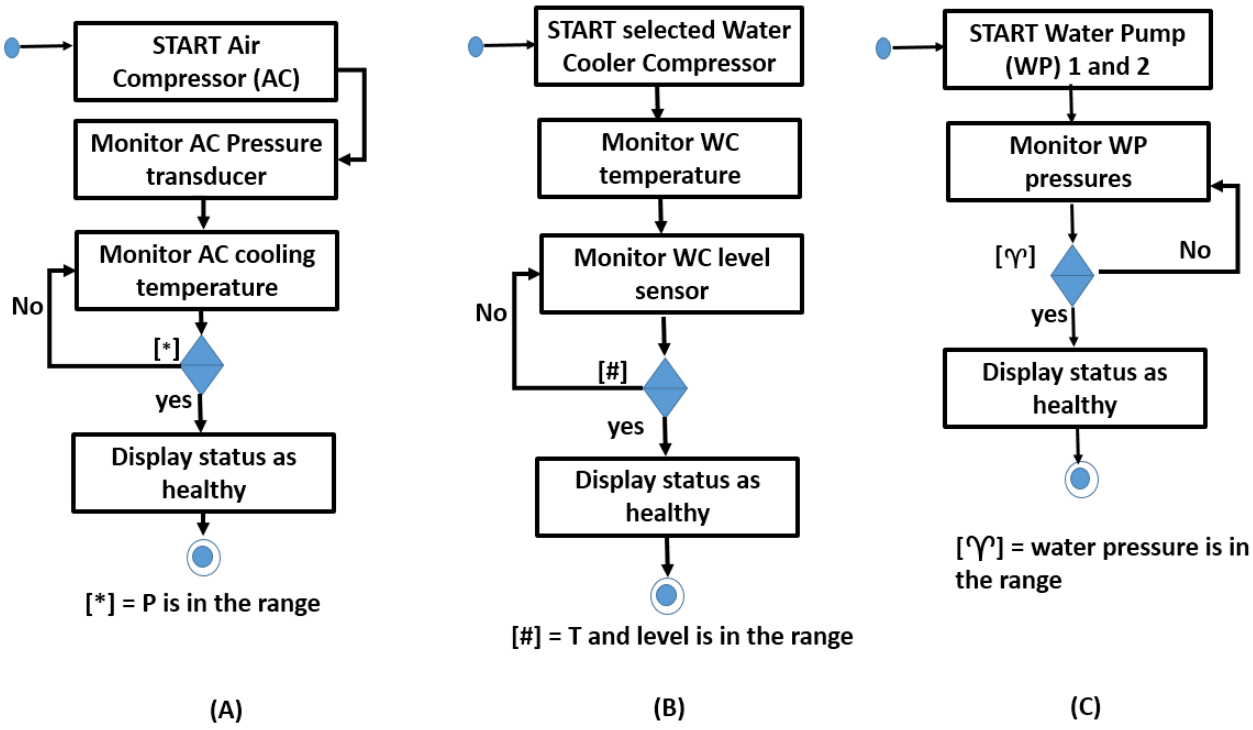

Figure 10 It shows activities for Air compressor, Water cooler compressor and Water Pumps startup. The subsequent activity shows the continuous monitoring of cooling parameters.

Vacuum production process (Startup): The device is a linear, cylindrical shaped (L=3m, Φ=2m, V > 9m^2), SS304, and double wall vacuum chamber. The chamber is split into two symmetrical halves and dish shaped closing end. A vacuum seal between the two chamber halves and at the two dish-end chamber joints each are provided by two viton o-rings fixed on the flanges, with interspace pumping provision using rotary pump. The closure of vacuum vessel followed by

auxiliaries is the trigger point of this process and will be given manually by the operator. The broader diagram of the vacuum production process is given by Figure 9. The operation of the vacuum production process is described by two step processes (A) Course vacuum production using Root and interspace pumping, (B) High vacuum production using combination of Diff-stack pumps.

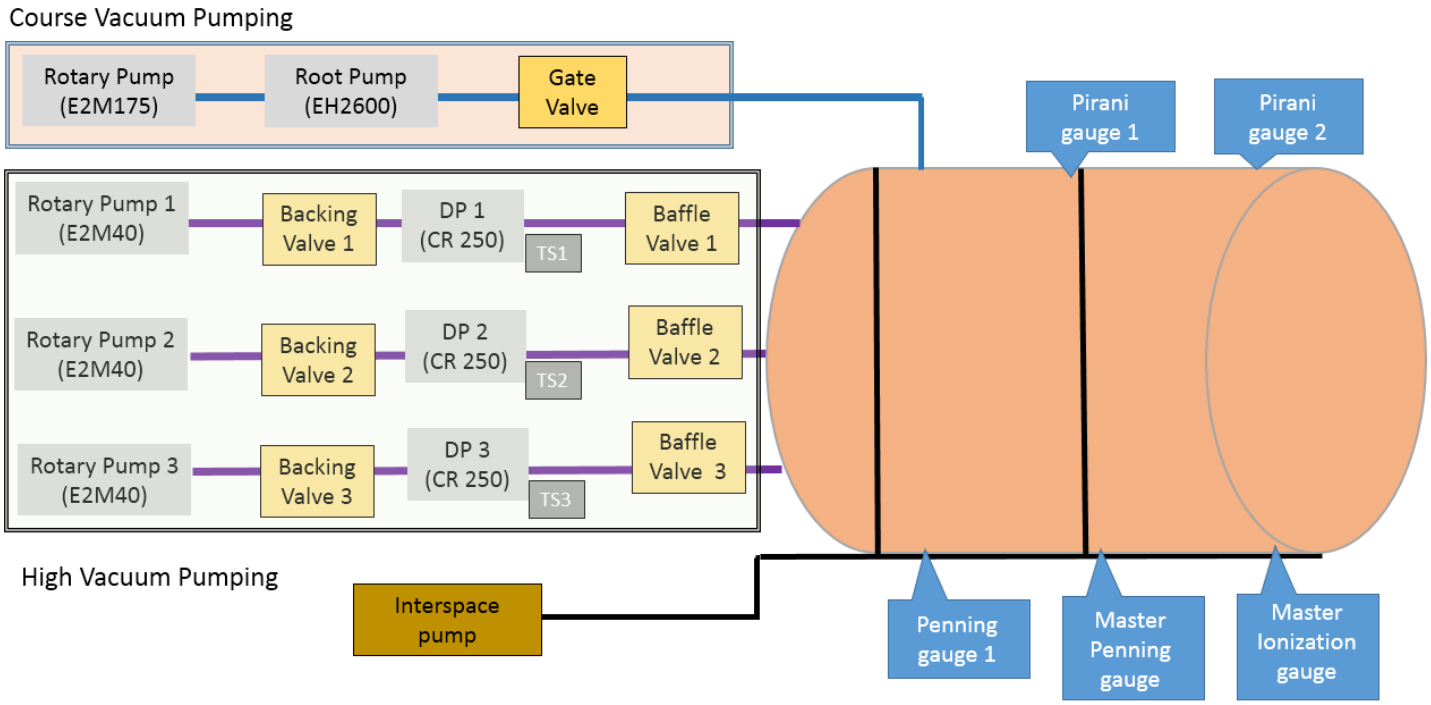

Figure 11 Vacuum production system description is presented here which consist of course and High vacuum stages.

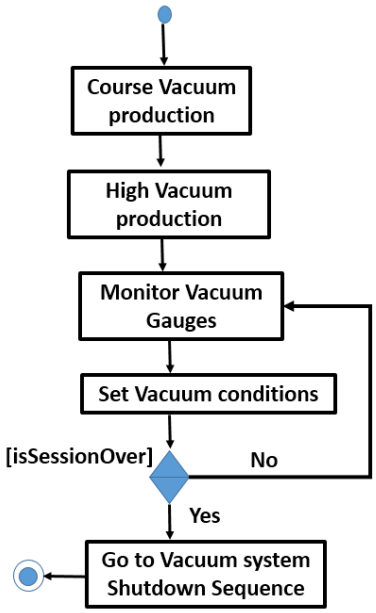

Figure 12 The description of the vacuum production process in LVPD is described in this flow chart. The activities inside course and high vacuum production are described separately for clarity purpose the conditions set by the vacuum gauges enables the changeover,

time out or fault indication. During Roughing condition Pirani 1 and Pirani 2 gauge is watched and after change over from course to High the Penning and Master ionization gauge on.

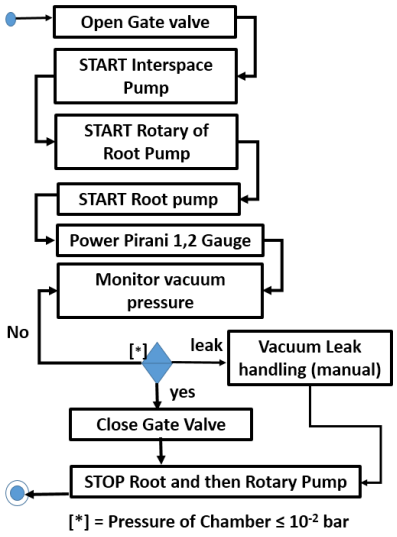

Figure 13 The description of the course vacuum production steps in LVPD is described in the flow chart. The condition describe the pressure of the chamber reaches to enable changeover.

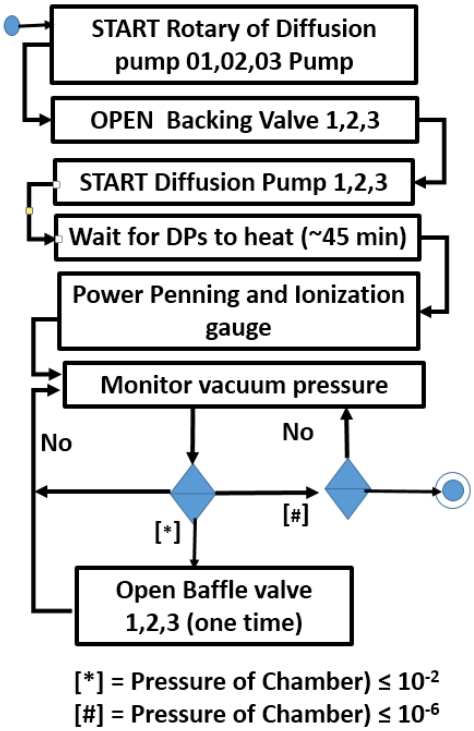

Figure 14 The description of the granular vacuum production steps in LVPD is described in the flow chart. When the pressure of the chamber reaches the specified threshold the pumping by DP starts when pressure reaches the specified vacuum range the Baffle valve is open and Gate valve is closed.

Gas Feed process

Gas feed process is responsible for leaking Ar Gas into the chamber for Ar plasma experiments. The sensing of the Ar Gas and associated analyzers are on before the experiments and after the experiment they are switched off. The completion of Gas Feed process initiate the plasma sequence and closure of plasma sequence cause power of necessary equipment.

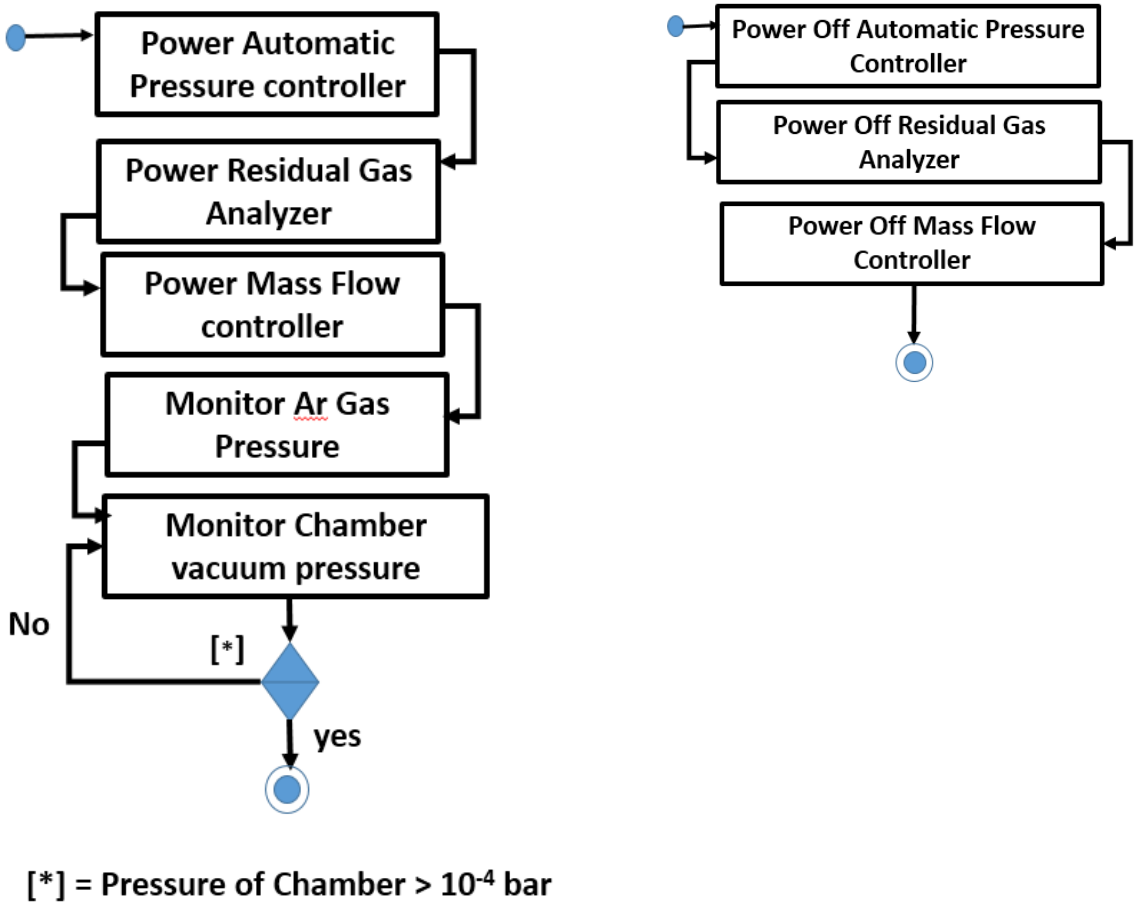

Figure 15 the process of Gas feed into the plasma chamber and thereafter showdown of the necessary equipment (after Plasma investigations are over) is described here.

Vacuum Shutdown Sequence: This sequence is carried out before the auxiliary's shutdown sequence and the steps are exactly reverse of the pump startup sequence. The timing diagram of the sequence and auxiliaries are described by Figure 10 are explained below. As the course pumping process is already completed so we close the pumps started for granular pumping in this process. Following the flowchart for this process.

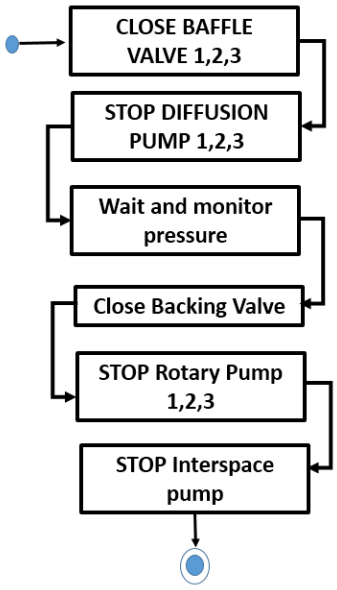

Figure 16 It describe the process flow chart of the shutdown process of vacuum system

Auxiliaries Shutdown Sequence: This is carried out by the end of the day and the steps are exactly reverse of the auxiliaries startup sequence carried out in the morning while start of experimental day. It brings the system again to INITIALIZED state. The timing diagram of the auxiliaries' startup sequence is described by timing diagram by Figure 10 and explained below.

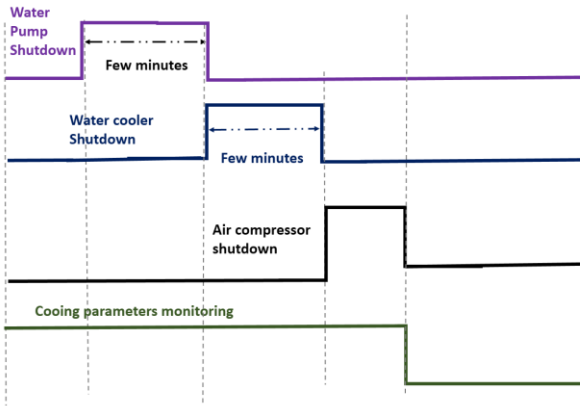

Figure 17 Auxiliaries shutdown sequence is presented here.

Appendix N FAT and SAT Qualification Criteria

Check list during Factory acceptance test

S/N	Description	Check (✓/X)	Remark (if any)
1	Electrical component verification for functionality, data sheet, control/signals and related documentations.		
2	Control component such as PLC CPU, I/O modules, HMI for functional verification, configuration, calibration certificates, datasheets etc.		
3	Software components such as PLC programming software, SCADA software, OPC interface to LabVIEW etc.		
4	High level design documents including software design/development, integration schema etc.		
5	Demonstration of standalone operation of the startup sequence using emulated signals and flow diagrams. Party must have enough numbers of switches for digital feeds, enough numbers of analog feed with potentiometric controls for DI and AI emulation at factory, apart from this the response of the PLC could be seen at either lamps/ LEDs / Relays or suitable actuators to verify the simulated normal operation for control of hardware and software and the behavioral response of the programmed control upon subjecting them to faulty situations. To be tested for point no 6 and 7 below.		
6	Demonstration of standalone operation of the shutdown sequence using emulated signals.		
7	Demonstration of integrated operation of startup and shutdown sequences using emulated signals.		
8	Agreed Development and integration document.		

Check list during System Acceptance Test (SAT)

S/N	Description	Check (✓/X)	Remark (if any)
1	All the above tests as described by the FAT		
2	Cable tray laying and interfacing with subsystems		
3.	Demonstration of the startup sequence of the LVPD System		
3	Demonstration of shutdown sequence of the LVPD System.		
4	Demonstration of integrated operation of LVPD system		
5	Integrated Test report and handover		

Appendix O Sample HMI screen

The HMI mounted on the field provides, an alternate mode of operation apart from main GUI presented on the PC. The Startup and Shutdown sequence is started as per user input. The three mode of operation are considered, (i) Auto mode (Default mode) where the system is operational by automatic execution of the control logic, (ii) Bypass mode where the particular process (or a part of it) is bypassed due to some maintenance or test considerations, (iii) Manual mode of operation in case of fault of a subsystem. In case of manual mode of operation, the section C are the respective sub screens (Tab based) where relevant parameters are presented. HMI presents a backup strategy of the operation of the system.

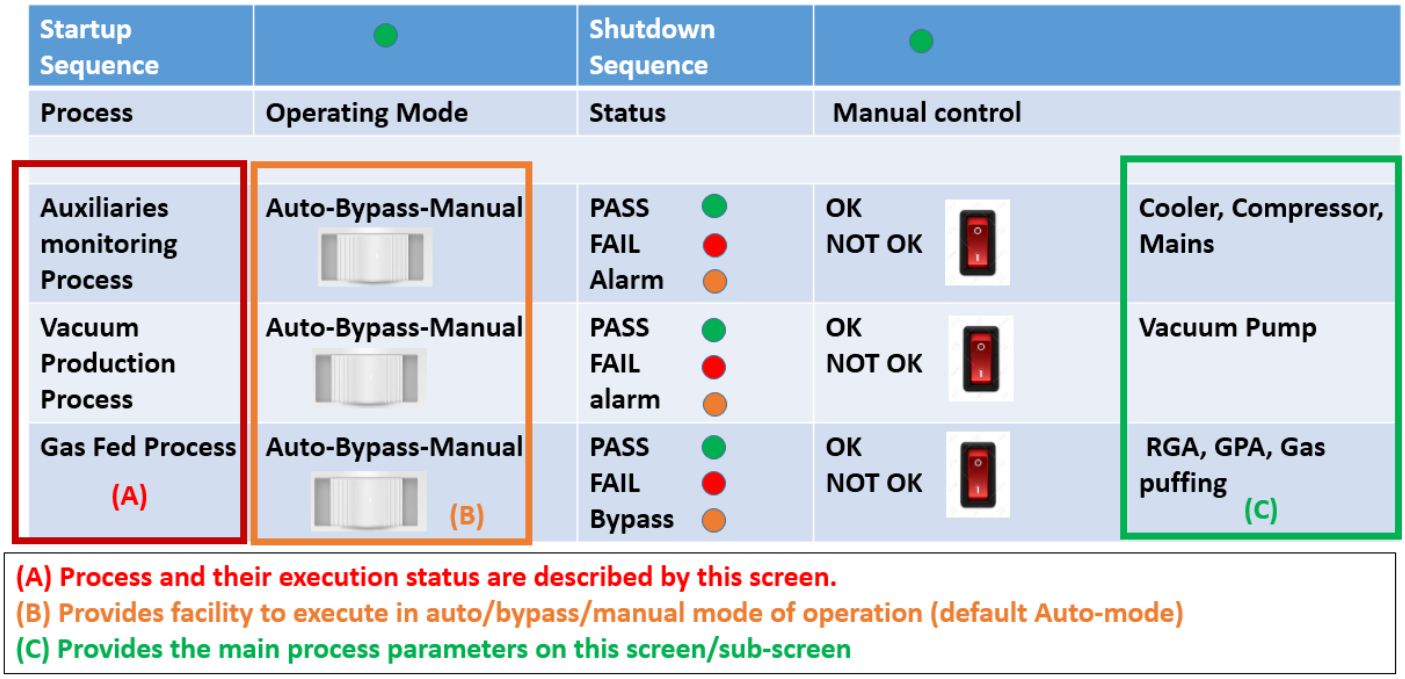

Figure 18 The sample HMI screen is presented here for the demonstion purpose and details subscreens will be worked out with solution provider.

SECTION ‘D’
FORMAT FOR SUBMISSION OF PART-II (PRICE)

Validate Print Help

Item Rate BoQ

Tender Inviting Authority: Head-Purchase Section

Name of Work: Supply, Installation, development and Commissioning of Process Automation System for Large Volume Plasma Device Upgrade (LVPD-U) at Institute for Plasma Research, Gandhinagar as per the detailed specifications mentioned in the tender documents.

Tender No: IPR/TN/PUR/TPT/ET/21-22/037 dated 30/12/2021

Name of the Bidder/ Bidding Firm / Company :	

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

NUMBER #	TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	Quantity	Units	BASIC RATE In Figures To be entered by the Bidder in Rs. P	TOTAL AMOUNT Without Taxes in Rs. P	TOTAL AMOUNT In Words
1	2	4	5	13	53	55
1	Supply of SCADA Software (Appendix D) and PLC Programming Software (Appendix E) as per the detailed specifications mentioned in the tender documents.	1.000	Set		**0.00**	INR Zero Only
2	Supply of HMI (Appendix F), Industrial PC (Appendix G) and PLC System (Appendix I) as per the detailed specifications mentioned in the tender documents.	1.000	Set		**0.00**	INR Zero Only
3	Supply of Mandatory Electrical Components (Appendix J) as per the detailed specifications mentioned in the tender documents.	1.000	Set		**0.00**	INR Zero Only

4	Supply of mandatory spares electrical components (Appendix K) as per the detailed specifications mentioned in the tender documents.	1.000	Set		**0.00**	INR Zero Only
5	Charges for Software development (Appendix M) and supply to IPR as per the detailed specifications mentioned in the tender documents.	1.000	Set		**0.00**	INR Zero Only
6	Charges for Integration job work, cabling and laying (Appendix H) as per the detailed specifications mentioned in the tender documents.	1.000	Service		**0.00**	INR Zero Only
Total in Figures					**0.00**	INR Zero Only
Quoted Rate in Words					**INR Zero Only**	