प्लाज़्मा अनुसंधान संस्थान
Institute for Plasma Research
Bhat, Gandhinagar 382 428, Gujarat, (India)
भाट, गांधीनगर ३८२ ४२८, गुजरात, (भारत)

Notice Inviting Tender
(NIT)

निविदा सूचना TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/22-23/002 दिनांकित DATED 08-06-2022

निदेशक, प्लाज़्मा अनुसंधान संस्थान (आईपीआर) के लिए और उनकी ओर से प्रमुख- क्रय एवं भंडार अनुभाग, प्लाज़्मा अनुसंधान संस्थान, क्रेता की निविदा विनिर्देशों के अनुसार अनुबंध के निष्पादन हेतु **दो भाग** में ऑनलाइन निविदाएं आमंत्रित करते हैं। निविदा आमंत्रण, निविदा शर्तें, अनुबंध की सामान्य शर्तें, अनुबंध की विशेष शर्तें और अनुबंध की अतिरिक्त शर्तें, यदि कोई हो, जो निविदा के अनुसार अनुबंध को नियंत्रित करेगी, संलग्न हैं।

बोली जमा करने के इच्छुक बोलीदाताओं से अनुरोध है कि वे इस दस्तावेज़ की सामग्री को देखें और सुनिश्चित करें कि निविदा आमंत्रण सूचना में निर्दिष्ट नियत तारीख और समय पर या उससे पहले और तकनीकी विनिर्देशों एवं नियमों और शर्तों के अनुसार बोली ऑनलाइन जमा करें और इसके साथ संलग्न प्रपत्र संख्या **e_IPR-PUR-103A** एवं **e_IPR-PUR-103B** डिजिटल रूप से हस्ताक्षरित या स्याही से हस्ताक्षरित वचनपत्र को अपलोड करें।

ऑफलाइन बोलियां हार्ड कॉपी सहित किसी भी रूप में स्वीकार नहीं की जाएगी।

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** 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 Nos. **e_IPR-PUR-103A** and **e_IPR-PUR-103B.**

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

प्रमुख-खरीद अनुभाग / Head-Purchase Section
निदेशक, आईपीआर के लिए और उनकी ओर से / For and on behalf of Director, IPR
(खरीदार /The Purchaser)

संलग्नक :ऊपर के रूप में। / Encl: as above.

निविदा सूचना TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/22-23/002 दिनांकित DATED 08-06-2022

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.

कार्य/वस्तु विवरण / Work/Item Description	Design, Engineering, Fabrication, Supply inlcuding unloading, installation & commissioning, testing and site accceptance at IPR site of WATER POLISHING SYSTEM comprising DM plant, EDI units with oxygen removal (membrane contactor type) system comprising of all necessary equipment, interconnected piping, valves with actuators, support structures, instrumentation with electricals (MCC/LPBSs) , power and instrumentation cabling, wiring, earthing, and PLC based monitoring Data Acquisition and Control System (SCADA) comprising of software and hardware, including construction of waste water disposal tank and minor civil works as per the details mentioned in technical specifications of the tender document – 1 Set.
निविदा शुल्क / Tender Fee	Not Applicable
बयाना राशि जमा)ईएमडी / (Earnest Money Deposit (EMD)	**Rs. 10,00,000.00 (RUPEES TEN LAKHS)** **Earnest Money Deposit (EMD)** must be in the form of **Demand Draft drawn** in favour of "**Institute for Plasma Research**" payable at **Gandhinagar** and **a copy** thereof **must be uploaded along with quotation.** Demand Draft shall be sent to "**Head-Purchase Section, Institute for Plasma Research, Bhat, Near Indira Bridge, Gandhinagar-382428** in a **sealed envelope super scribing** boldly **Tender Number and Due date, so as to reach before the due date and time. Offers opened without receipt of EMD before due date and time will be rejected. EMD will be forfeited if the bidder withdraws or amends, impairs or derogates from tender in any respect within the period of validity of the tender.** **Exemption from Payment of EMD : As per Tender Document**
प्रकाशन तिथि / Publishing Date	**08-06-2022 at 18:00 Hrs.**
दस्तावेज़ डाउनलोड /बिक्री प्रारंभ तिथि / Document Download / Sale Start Date	**08-06-2022 at 18:00 Hrs.**
स्पष्टीकरण प्रारंभ तिथि / Seek Clarification Start Date	**08-06-2022 at 18:00 Hrs.**
स्पष्टीकरण समाप्ति तिथि / Seek Clarification End Date	**15-06-2022 by 17:00 Hrs.**
आईपीआर द्वारा स्पष्टीकरण का जवाब / Response to Clarification by IPR	**01-07-2022** by **17.00 Hrs**
बोली जमा करने की तिथि / Bid Submission Start Date	**02-07-2022** at **10.00 Hrs**
बोली जमा करने की अंतिम तिथि / Bid Submission Closing Date	**26-07-2022** at **13.00 Hrs**
भाग-I (तकनीकी बोली (के ऑनलाइन खुलने का समय और तिथि / Time and Date of online Opening of PART-I (Technical Bid)	**27-07-2022** at **14.00 Hrs**
भाग-II के ऑनलाइन खुलने का समय और तिथि)मूल्य बोली / (Time and Date of online Opening of PART-II (Price Bid)	**Will be declared later on**

पूर्व-बोली पूछताछ की प्राप्ति के बाद 22-06-2022 @ 10:30 बजे पर वीडियो कॉन्फ्रेंस के माध्यम से विक्रेताओं के साथ प्री-बिड मीटिंग आयोजित की जाएगी। इच्छुक विक्रेताओं को 19-06-2022 पर या उससे पहले निम्नलिखित लिंक के माध्यम से पूर्व-बोली बैठक में भाग लेने के लिए सवयं को पंजीकृत करना आवश्यक है:

https://forms.gle/KqsS5eUyR8kBz2J8A

पासवर्ड के साथ वीडियो कॉन्फ्रेंस के माध्यम से निर्धारित पूर्व-बोली बैठक में शामिल होने के लिए वेब लिंक को उन विक्रेताओं के साथ साझा किया जाएगा, जिन्होंने 21st june, 2022 तक केवल उपरोक्त लिंक के माध्यम से (पूर्व-बोली बैठक भागीदारी के लिए) पंजीकृत किया है। यदि, उन्हें वीडियो कॉन्फ्रेंस में शामिल होने के लिए लिंक प्राप्त नहीं होता है, वे निविदा आमंत्रण अधिकारी से nodalofficer.et@ipr.res.in **पर संपर्क कर सकते हैं।**

कृपया ध्यान दें कि यदि इस निविदा में किसी भी प्रकार का स्पष्टीकरण आवश्यक हो, चाहे वह तकनीकी है या अन्यथा, तो बोलियां जमा करने से पहले स्पष्टीकरण प्राप्त करना होगा।

पात्रता मानदंड और निविदा दस्तावेज के साथ विस्तृत निविदा सूचना वेबसाइट https://eprocure.gov.in/eprocure/app पर नि:शुल्क देखने और डाउनलोड करने के लिए उपलब्ध है। ई-निविदा प्रक्रिया में भाग लेने के लिए, उपरोक्त ई-निविदा पोर्टल पर पंजीकृत होना अनिवार्य है और डिजिटल हस्ताक्षर प्रमाणपत्र)कक्षा-III) होना आवश्यक है। नए पंजीकरण/निविदा के लिए, बोलीदाता नीचे दिए गए "ऑनलाइन बोली जमा करने हेतु निर्देश "पढ़ सकते हैं।

इस एनआईटी की एक प्रति संस्थान की वेबसाइट **www.ipr.res.in** पर भी उपलब्ध है**।**

Pre-bid meeting with the vendors will be held through Video Conference on **22-06-2022** @ 10:30 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 **19-06-2022**:

https://forms.gle/KqsS5eUyR8kBz2J8A

The web link to join the scheduled pre-bid meeting through Video Conference along with password will be shared with the vendors who have registered themselves through the above link only (for pre-bid meeting participation) by **21st June, 2022.** In case, if they do not receive the link to join the video Conference, they may contact the Tender Inviting officer at 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.

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** .

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 submittingtheir 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 usernameand 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: e_IPR-PUR-103

प्लाज्मा अनुसंधान संस्थान
INSTITUTE FOR PLASMA RESEARCH
(भारत सरकार के परमाणु ऊर्जा विभाग का सहायता प्राप्त संस्थान)
(An Aided Institute of Dept. of Atomic Energy, Govt. of India)
इंदीरा ब्रिज के पास, भाट, गांधीनगर – 382428,
NEAR INDIRA BRIDGE, BHAT, GANDHINAGAR-382428

TWO-PART TENDER

INVITATION TO TENDER

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** 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 Nos. **e_IPR-PUR-103A** and **e_IPR-PUR-103B.**

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)

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DEFINITIONS AND INTERPRETATION

In the invitation to tender, tendering condition, contract, general conditions of contract and special conditions of contract, unless the context otherwise require the following interpretation shall be valid.

1.1 "BID" shall mean the quotation in response to the NIT submitted with EMD, if applicable and within the period mentioned in the NIT.

1.2 "BIDDER" means an individual, a firm, a limited liability partnership, a company whether incorporated or not, an association of person or joint venture who has submitted a bid to execute the contract and shall be deemed to include his successors, heirs, executors, administrators and permitted assignees, as the case may be.

1.3 "CONSIGNEE" shall mean the authorised representative or officer of the purchaser at the site to whom the stores are required to be delivered in the manner indicated in the contract.

1.4 "CONTRACTOR" means a successful bidder with whom a contract agreement has been entered to by the purchaser and shall be deemed to include his successors, heirs, executors, administrators and permitted assignees, as the case maybe.

1.5 "CONTRACT" or "PURCHASE ORDER" means and comprises of a letter or e- mailor ink signed or digitally signed document issued/sent by the purchaser conveying acceptance of bidder's/contractor's bid submitted in response to the NIT within the validity of the bid and any subsequent amendments/alterations thereto made on thebasis of mutual agreement.

1.6 "DELIVERY DATE" means date of completion of contract excluding warranty period and its obligations as stipulated in the contract.

1.7 "DIRECTOR, INSTITUTE FOR PLASMA RESEARCH" means the Director, Institute for Plasma Research, for the time being in the charge of the Purchase and Stores Department, IPR and includes Head- Purchase & Stores Department, Head- Purchase Section, Purchase Officer-II, Purchase Officer-I, Dy. Officer (Purchase) or Assistant Purchase Officer of the said Institute for Plasma Research or any other officer authorized in writing to execute the contract on behalf of the purchaser.

1.8 "EARNEST MONEY DEPOSIT (EMD)" means the deposit made in the form and manner specified in the NIT by the participating bidder towards bid security.

1.9 "HINDRANCE" means an event resulting in stoppage or delay of work because of the purchaser as recorded by the contractor and authenticated by the purchaser.

1.10 "INSPECTOR" or "QUALITY SURVEYOR" means any engineer/officer nominated and deputed by the purchaser or their appointed consultants or quality surveillance agency or any other person authorized by the purchaser from time to time to act as his representative for the purpose of inspection of stores under the contract.

1.11 "Notice Inviting Tender (NIT)" means invitation to tender, tendering condition, general conditions of contract, special conditions of contract, additional conditions of contract, if any and any other document mentioned thereto.

1.12 "PARTIES" mean the parties to the contract, i.e., the contractor and the purchaser named in the contract.

1.13 "PERFORMANCE SECURITY BANK GUARANTEE (PSDBG)" means the depositmade in the form and manner specified in this document by the contractor towards satisfactory performance of the contract till completion of the warranty period.

1.14 "PURCHASER" means Director, Institute for Plasma Research forthe time being the Head- Purchase and Stores Department or any other authorized officer and includes his successor or assignees.

1.15 "STORES" or "PLANT" means the materials, goods, machinery, plants, equipment or parts thereof specified in the contract which the contractor has agreed under the

contract.

1.16 “SUB-CONTRACTOR” means any contractor engaged by the contractor with the prior approval of the purchaser in relation to the contract.

TWO PART TENDER SECTION –A

Invitation to Tender and Tendering Conditions

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1. INVITATION TO TENDER

1.1 Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR), invites bids for execution of contract in accordance with the purchaser's technical specifications. The conditions of contract which will govern the contract pursuant to this tender are available in the NIT. Bidders who are in a position to be submitted online in Two Parts in English language as under:

1.2 PART-I (TECHNO-COMMERCIAL): This part of the bid shall include/contain all technical details, technical specifications, drawings submit their bid for the same as per the conditions stipulated in the NIT are requested to submit their bid in a manner and method specified in the NIT.

2 EMD

2.1 EMD where called for will have to be submitted by the participating bidder in the form and manner specified in the NIT so as to reach the purchaser at the address mentioned in the NIT on or before the due date and time mentioned in the NIT.

2.2 Non receipt of EMD as per Clause no. 2.1 above, will result in rejection of bid without any reference to the bidder, except in cases given under Clause no. 2.3 below.

2.3 The following categories of bidders are exempted from submission of EMD:

2.3.1 Bidders having valid registration with Directorate of Purchase and Stores, Department of Atomic Energy;

2.3.2 Micro and Small Enterprises having valid registration with MSME or NSIC or Udyog Aadhaar/ Udyam Aadhar in respect of procurement of goods and services, produced and provided by MSE and startups recognized by Department of Industrial Policy & Promotion (DIPP) are eligible for exemption according to government policies.

2.3.3 Foreign Bidder directly submitting bid (not through their Indian Agent or Indian Counterpart or Indian subsidy) in the currency other than INR.

2.4 Forfeiture of EMD

2.4.1 EMD shall be forfeited if the bidder withdraws or amends impairs or derogates from the tender in any respect within the validity of his bid.

2.4.2 If the successful bidder fails to furnish the required Security Deposit/ Performance Security Bank Guarantee (PSDBG), the EMD furnished shall be forfeited.

2.5 REFUND OF EMD

2.5.1 EMD of unsuccessful bidders will be returned within thirty days after finalization of the tender or after expiry of validity of their bid, whichever is later.

2.5.2 EMD of successful bidders will be returned within thirty days of submission of security deposit as called for in the contract.

3. MANNER AND METHOD FOR SUBMISSION OF BIDS

3.1 All bids in response to this invitation to tender shall, literature, reference to earlier supplies of similar stores along with quantity, time required for submission and approval of drawings, manufacturing and delivery period, inspection/testing procedure, itemized list of spares and quantity recommended by the bidder for purchase, term of price, mode and payment terms, mode of despatch, excluding any price details thereof. The bidder shall note that this part of the bid is purely techno-commercial.

3.2 The bidder shall not mention the price of the stores or the financial bid in the uploaded document as Part-I of the bid. If Bidder includes prices of the stores or the financial bid in Part-I (Techno-Commercial) of the bid, such bids will be rejected without any notice to the bidder.

3.3 Part-II (Price) of the bid shall be submitted strictly online in accordance with the format provided by the Purchaser.

3.4 The bidder shall quote cost of essential accessories and spares specified in the price bid format, wherever asked for, to make their bid complete in all respect as per purchaser's technical specifications in Part-II of bid.

3.5 If bidder indicates any changes of any nature of the Techno-Commercial bid or upload any technical document indicating changes of any manner/nature of Techno-Commercial bid in Part-II of the bid; such bids will be rejected without any notice to the bidder.

3.6 The bidder will co-relate the prices of stores in Part-II of the bid with the description of the stores indicated in Part-I (Techno-Commercial) of the bid in order to enable the purchaser to identify the prices with the corresponding stores in Part-I (Techno-Commercial) of the bid.

3.7 Both Part-I (Techno-Commercial) and Part-II (Price) of the bid should be submitted together online on or before the time and date specified for its submission in the NIT.

4 PRICE

4.1 The prices quoted must be FIRM during the currency of the contract.

5 PAYMENT TERMS

5.1 Standard payment terms for supplies made against this tender will be as indicated in Form no. IPR-P-100.

6 CONDITIONAL DISCOUNT

6.1 In case the bidder offers any conditional discount with regard to acceptance of the bid within a specific period or specific payment terms, delivery date, quantity, etc., the purchaser will not take into consideration such conditional discount while evaluating the bid.

7 VALIDITY OF BIDS

7.1 Bids shall be kept valid for acceptance for a period as mentioned in the NIT. Bids with shorter validity period shall be rejected without any notice to the bidder.

8 ONE BID PER BIDDER

8.1 Each bidder shall submit only one bid for a tender. All bids of the bidder who submits more than one bid for the same tender; will be rejected without any notice to the bidder.

8.2 If a bidder submits bid on behalf of two principals or if the bidder and his sister concern participates in the same tender or such instances where participation of any bidder leads to conflict of interest, the bid will be rejected without any notice to the bidder.

9 QUALIFYING REQUIREMENTS

9.1 The bidder is required to upload all supporting documents/information on the e- tender portal necessary for establishing their qualification as mentioned in the NIT.

10 PRE-BID MEETING

10.1 A pre-bid meeting for providing clarifications to the bidder will be held on-line unless otherwise specified, on the date and time mentioned in the NIT. Bidders participating in this tender and who have enrolled in our e-tender portal (https://eprocure.gov.in/eprocure/app) can login and upload their queries. Bidders are requested to upload their queries both Technical and Commercial well in advance at the eTender portal within the due date and time prescribed for the submission of queries. Queries/clarification/information sought in any other manner shall be ignored. Any modification to the tender, which may become necessary as a result of the pre-bid meeting, will be uploaded on the e-tender portal against the particular Tender ID. Bidders are requested to update themselves by visiting e-tender portal

(https://eprocure.gov.in/eprocure/app frequently. It may be noted that no queries will be entertained after the date and time for submission of queries. Therefore, bidders in their own interest should participate in the pre-bid meeting to understand the tendered requirements.

11 OPENING OF BID

11.1 Unless otherwise preponed or postponed, bids will be opened online in two stages on the date and time indicated in the NIT.

11.2 Part-I (Techno-Commercial) of the bid will be opened at the first stage on the due date and time indicated for opening in this NIT.

11.3 All the bidders who have submitted bids within the due date and time specified for its submission can view the list of bidders who have participated in the tender online after opening of the tender.

11.4 After completion of the evaluation of the Part-I (Techno-Commercial) of the bid, the due date and time for opening of Part-II (Price) of the bid shall be intimated to the bidders whose bids are found technically acceptable to the purchaser. The due date and time will also be displayed on the e-tender portal.

11.5 Part-II (Price) of the bid, whose Part-I of the bid is found to be techno-commercially acceptable to the Purchaser can be viewed.

12 DECLARATION OF HOLIDAY

12.1 If the date(s) specified for opening of the bid is/are declared as holidays due to any administrative reasons, then the due date(s) for receipt/opening of bid will get postponed to the next working day.

13 EVALUATION OF BIDS

13.1 TECHNICAL CLARIFICATION

After opening the Part – I (Techno-Commercial) of the bid, if it becomes necessary for the technical authorities/user department of the purchaser to seek clarifications from the bidder, the same will be sought for from the bidder by the Purchase Section. In such an event, the bidder shall furnish all techno-commercial information/clarification to the Purchase Section to reach them on or before the due date and time fixed by the Purchaser. If the techno-commercial clarifications/details sought for by the Purchase Section from the bidder do not reach them on or before the due date and time fixed for its receipt, such bid will be liable for rejection at the discretion of the purchaser without any further notice. The bidder shall not, however, furnish a new bid at this stage. A new bid at this stage will be rejected by the purchaser.

13.2 Evaluation of bids shall be based on technical specification attached with tender and on the basis of total landed cost considering taxes/duties as applicable without any concession/exemption.

13.3 **DETERMINATION OF TOTAL LANDED COST FOR COMPARISON (AIR/SEA SHIPMENTS)**

13.3.1 The following will be the loading for air/sea freight

13.3.1.1 FCA/FOB price + air/sea freight @10% of FCA/FOB price = CFR price

13.3.1.2 CFR price + insurance @ 1% of CFR price= CIF price

13.3.1.3 CIF price + taxes & duties as applicable =DDP

13.3.1.4 [DDP + clearing charges @ 1% of CIF price + inland freight @ 1% of CIF price] x exchange rate = total landed cost in INR

Exchange rate means Purchase price of the quoted currency as intimated by State Bank of India and as applicable on the date of opening of bid.

13.4 **CAPACITY AND FINANCIAL CAPABILITY**

13.4.1 In case it is found that the bidder does not possess the requisite infrastructure, capacity, capability and their financial capability satisfactory or not meeting the qualification criteria indicated in the NIT or not complied with warranty obligations; such bids are liable to be rejected by the purchaser during evaluation of bid.

13.5 **PAST PERFORMANCE**

13.5.1 In case the past performance of the bidder is not found to be satisfactory with regard to quality, delivery date, warranty obligation and compliance of terms and conditions of the contract, their bid is liable to be rejected by the purchaser during evaluation of bid.

13.6 **POST SUPPLY INSPECTION**

13.6.1 The bidder should clearly mention requirement of post supply inspection in the bid. The purchaser reserves the right to deny access to the contractor or its representative or any third party to the Stores supplied by the contractor after its supply. Bids which are not complying with this post supply inspection requirement are liable to be rejected by the purchaser during evaluation of bid.

14 QUANTITY

14.1 Quantities mentioned in the NIT are approximate. 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 by the purchaser. A bidder shall be bound to supply to the purchaser such an item or items or such portion or portions of one or more of the items as may be accepted by the purchaser.

15 INSTALLATION/ERECTION AND COMMISSIONING

15.1 Wherever, the purchaser's NIT includes installation and commissioning or supervision of installation and commissioning or erection and commissioning of the stores by the bidder, the bidder must clearly and separately quote the prices for the supply of the Stores and the charges for installation and commissioning or its supervision or erection and commissioning, as the case may be.

15.2 The bidder should not include charges towards installation and commissioning or its supervision or erection and commissioning in the price of the stores offered. In case of failure to quote separately, purchaser will deduct taxes as applicable on full contract value.

15.3 In respect of contracts involving installation and commissioning or its supervision or erection and commissioning by the contractor where identifiable charges for the same have been quoted, the contractor shall bear the tax liability as per the rates prevailing at the time of undertaking the job in accordance with the relevant Act/Laws in force in India.

15.4 When 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.

16 TEST CERTIFICATE

16.1 Wherever the tests and test certificates are required by the purchaser, test shall be conducted and test certificate shall be furnished by the contractor as per the requirement of technical specification.

17 OPERATION/INSTRUCTION MANUAL:

17.1 In respect of stores where instruction/operation manual is essential to enable the purchaser to put the stores into proper use, the contractor shall furnish such instruction/operation manual in English language along with the stores free of cost.

18 LEAFLET/CATALOGUE:

18.1 Bidder shall upload all necessary catalogues/drawings technical literature data sheet as are considered essential for full and correct evaluation of their technical bid. The bids are liable to be ignored if this condition is not complied with.

19 ACCEPTANCE OF BID

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

19.2 The purchaser also reserves the right to reject the bid, which is not in conformity with the conditions contained in this document or the instructions to bidders attached in NIT, if any including non-acceptance of submission of securities as called for in the NIT.

Clauses 20.0 to 24.0 are applicable only for bids quoted in INDIAN RUPEES.

20 STATUTORY LEVIES SUCH AS GOODS AND SERVICE TAX

20.1 Statutory levies at rate applicable for the purchaser within original delivery date will be admitted by the purchaser.

20.2 GOODS AND SERVICE TAX

20.2.1 The purchaser is entitled for GST at the concessional rate as per notifications issued by the Government, as amended from time to time, in respect of purchases made for certain stores.

20.3 Decision to avail concession/exemption, in each case will be at the sole discretion of the purchaser. Wherever concession/exemption is mentioned in the contract, purchaser will provide the relevant certificate to the contractor. It would be the responsibility of the contractor to obtain the same from the purchaser before effecting the delivery of stores failing which the excess tax paid by the contractor shall not be reimbursed by the purchaser.

21 CUSTOMS DUTY

21.1 In case an Indian bidder submits a bid for supply of outrightly imported stores in Indian Rupees, they should quote price for free and safe delivery of stores at destination. The name of their foreign contractor and country of origin shall also be indicated. However, purchaser will neither provide any certificate for availing concession/exemption from payment of customs duty nor will reimburse the same.

21.2 Bids on High Sea sales basis will not be considered.

22 FLUCTUATION IN THE STATUTORY LEVIES

22.1 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 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.

23 AUTHENTICATION

23.1 The person digitally signing and uploading the bid or any other document in respect of the tender on behalf of the bidder shall be deemed to warrant that he has the authority to do so and the action will be binding on the bidder. The bidder shall indemnify the purchaser from any consequences arising thereof.

23.2 Overseas bidder should also refer Clause No. 46.1 of this Section for details on obtaining digital signature certificate valid in India.

23.3 If, on enquiry or later on, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the bidder and signatory liable jointly and severally for all costs

and damages.

24 DELIVERY OF STORES FOR CONTRACT IN INDIAN CURRENCY

24.1 Bidder should note that the bid is liable for rejection by the purchaser unless the bidder offers to complete the contract within the delivery date specified by the purchaser. The prices quoted by the bidder should include all charges involved for direct and safe delivery of the stores to the place of delivery indicated by the purchaser. Purchaser will neither undertake responsibility for transit insurance nor pay for it separately. The bidder shall quote as per the delivery terms stated in the NIT.

24.2 The stores shall neither be despatched under 'purchaser's risk' nor consigned to 'self', but only to the consignee indicated in the contract. Non-adherence to this condition shall make the contractor liable to bear all consequential penalties/expenses such as demurrage, wharfage, etc. which the purchaser may incur.

24.3 The consignee will, as soon as possible, but not later than thirty 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 stores as is appropriate, free of all charges. In case it is desired by the contractor for returning of the stores to them, all expenses towards transportation, etc. will be borne by the contractor and the contractor will also furnish bank guarantee as per format in Annexure for the payment already made by the purchaser to the contractor on this account, if any.

25. DOCUMENTS TO BE UPLOADED BY INDIAN BIDDER

25.1 Indian bidders are required to upload a copy of the PAN card/letter and copy of the factory registration/licence or shop establishment certificate/GSTIN etc. as applicable with the bid.

26. PURCHASE/PRICE PREFERENCE

26.1 Purchase/price preference to industries will be given as per the policy of the Government of India in force at the time of opening of bids provided their bid is in compliance with the conditions of the policy.

26.2. PURCHASE PREFERENCE FOR MICRO & SMALL ENTERPRISES (MSE's):

26.2.1. Benefits, as prescribed by the MSME Policy of the Government of India shall be provided to MSE vendors registered as manufacturers for the goods procured or for the service providers for services to this Department. The procuring Entity reserves its option to give price preference to Micro and Small Industries in comparison to the large-scale industries as per policies of the Government from time to time.

26.3. MAKE IN INDIA:

26.3.1. 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.

26.3.2. 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 Directorate, 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.

26.3.3. 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.

26.3.4. 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 Directorate, in the manner specified there in the order.

26.3.5. 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 as per Annexure-XI failing which bid will be rejected. 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.

26.3.6. 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.

26.3.7. 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.

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

26.3.9. Bidders/contractors 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):

26.3.9.1. 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.

26.3.9.2. Class-II Local supplier is with local content 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.

26.3.9.3. 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.

26.4. GLOBAL TENDER:

The currency of the price quoted in the bid can be in foreign currencies, in addition to the Indian rupees, except for expenditure incurred in India (Including incidental services rendered in India and agency commission, if any) which should be stated in Indian Rupees.

26.5. ELIGIBILITY OF BIDDERS FROM SPECIFIED COUNTRIES:

26.5.1. 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.

26.5.2. 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.

Furthermore, every bidder participating against this Department tender shall invariably enclose along with the Bid, a self-declared undertaking "Annexure to Bid Form: Eligibility Declarations" (Annexure-XII), failing which Bid will be rejected.

27. FREE ISSUE MATERIAL (FIM): (This clause shall apply only to contract for supply of fabricated stores with purchaser's FIM)

27.1 Wherever the contract envisage supply of FIM by the purchaser to the Indian contractor for fabrication of the stores, such FIM shall be safeguarded by a Bank Guarantee as per format in Annexure or insurance policy to be provided by the Indian contractor at his own cost for the full value of FIM and the insurance policy or Bank Guarantee shall cover, the following risks specifically and shall be valid for six months beyond the delivery date.

27.2 RISKS TO BE COVERED: Any loss or damage to the FIM 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 objects falling on FIM while in his possession including transit period.

Insured by:	(Name of the contractor)
Beneficiary:	Head- Purchase and Stores Department, Institute for Plasma Research, (On behalf of Director, Institute for Plasma Research), Near Indira Bridge, Bhat Gandhinagar-382428
Amount for which insurance Policy/Bank Guarantee has to be Furnished	The amount will be indicated in the respective contract.

27.3 Notwithstanding the insurance cover taken out by the Indian contractor as above, the contractor shall indemnify the purchaser and keep the purchaser indemnified to the extent of the value of FIM 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 FIM for any job other than the one contracted out in this case and also not indulge in any act, commission or omission or negligence which may cause/result in any loss/damage to the purchaser and in which case, the contractor shall be liable to pay full compensation to the purchaser to the extent of damage/loss as assessed by the purchaser. The decision of the purchaser will be final and accepted by the contractor. The contractor shall be responsible for the safety of the FIM after these are received by him and all through the period during which the materials remain in his possession/control/custody. The FIM on receipt at the contractor's works shall be inspected by him for ensuring safe and correct receipt of FIM. The contractor shall report the discrepancies, if any, to the purchaser immediately but not later than five working days from the date of receipt of FIM. The contractor shall take all necessary precautions against any loss, deterioration, damage or destruction of the FIM from whatever cause arising whilst the said FIM remain in his possession/custody or control. The FIM shall be inspected periodically at regular intervals by the contractor for ensuring safe preservation and storage and maintain inspection report. The contractor shall also not mix up the FIM in question with any other goods and shall render true and proper account of the FIM actually used and return balance/remaining/unused FIM on hand and scrap within the delivery date. If it is not possible to return balance remaining unused FIM on hand and scrap within

the delivery date, the contractor hereby authorizes the purchaser to deduct the difference between the cost of FIM supplied and the cost of FIM actually used from the amount payable to the contractor. The contractor shall also indemnify the purchaser to compensate the difference in cost between the actual replacement cost of FIM lost/damaged and the claim settled in favour of the purchaser by the insurance company. The decision of the purchaser, as to whether the contractor has caused any loss, destruction, damage or deterioration of FIM while in his possession, custody or control from whatever cause arising and also on the quantum of damage suffered by the purchaser, shall be final and binding upon the contractor.

27.4 Wherever the contract envisage supply of FIM by the purchaser to the foreign contractor for fabrication of the stores, such FIM shall be safeguarded by a Bank Guarantee to be provided by the contractor at his own cost for the full value of FIM and the Bank Guarantee shall cover, the risks mentioned in Clause 27.2 and 27.3 above and shall be valid for six months beyond the delivery date.

27.5 FIM will be issued to the contractor only after receipt of the insurance policy/Bank Guarantee 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.

28. BIDS FROM INDIAN AGENTS ON BEHALF OF FOREIGN CONTRACTOR

28.1 Indian agents are allowed to quote on behalf of only one foreign contractor against this tender.

28.2 In case the bid is submitted by an Indian bidder or Indian agent on behalf of their foreign contractor, following documents is required to be uploaded with the bid, failing which, bid is liable to be rejected without further notice to the bidder.

28.2.1 Copy of the agency agreement between the principal and the Indian agent showing the percentage or the quantum of agency commission payable and included in the price quoted and a valid letter of authority from the principal authorizing the Indian agent to submit the bid on their behalf should be uploaded with the bid. The agency agreement shall be valid on the date of opening of bid and shall remain valid throughout the currency of contract.

28.2.2 The type and nature of after sales services to be rendered by the Indian agent.

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

29.1 Any contravention of the above-mentioned provisions by the bidder or contractor or its sub-contractor, consultant, adviser or its employees will invite penal consequences under the aforesaid legislations as amended from time to time.

30. PROHIBITION AGAINST USE OF THE NAME OF INSTITUTE FOR PLASMA RESEARCH WITHOUT PERMISSION FOR PUBLICITY PURPOSES

30.1 The bidder or contractor or its sub-contractor, consultant, adviser or its employees or any one claiming on behalf of them shall not use the name of Institute for Plasma Research for any publicity purpose through any public media like Press, Radio, T.V. or Internet without the prior written approval of the purchaser.

31. CONFIDENTIALITY

31.1 The 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 bidder or contractor as the case may be, and should not be disclosed or passed on to any other person/firm without prior written consent of the purchaser. This clause shall also apply to anyone claiming through bidder or contractor, i.e., the sub-contractors, consultants, advisers of the contractor and its employees, etc.

32. CANVASSING

32.1 Canvassing in any form with regard to this tender will lead to rejection of the bid

33. EXPORT LICENCE/EXPORT PERMISSION

33.1 It is entirely the responsibility of the bidder or contractor to obtain export permission/license/authorisation for stores of foreign origin as required from the respective Government before arranging shipment.

33.2 Establishment of letter of credit or similar payment instruments shall be done only after receipt of export license/export permission, if applicable the contract/ purchase order.

33.3 The contractor 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 Stores, while seeking export permission/license. It is, therefore, necessary that the contractor offering stores from foreign countries shall have thorough knowledge of export contract regulations prevalent in those countries.

33.4 Post supply inspection by the contractor or his representative or any third party at purchaser's site, contrary to the terms and conditions of purchaser's contract shall not be permitted.

34. END USE CERTIFICATE

34.1 Whenever an End Use Certificate is desired by the bidder, the same shall be clearly mentioned in the bid and the purchaser shall provide an End Use Certificate as per the format given below. The purchaser will not provide any other document/declaration in this regard.

END USE STATEMENT

"We hereby certify that the item/s i.e..... being procured from M/s…… against our Purchase Order No. IPR/…….…… 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".

35. COMPLIANCE WITH THE SECURITY REQUIREMENTS OF THE PURCHASER

35.1 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 purchaser's premises, wherever authorized by the purchaser.

36. COUNTRY OF ORIGIN

36.1 Wherever the tenders are for imported stores, the country of origin of the stores must be clearly specified in the bid.

37. TERMS AND CONDITIONS OF THE CONTRACT

37.1 It must be clearly understood that any contract concluded pursuant to this NIT shall be governed by the General, Special and Additional Conditions of the Contract as contained in the NIT. Bidder must, therefore, take special care to go through the NIT. It should also be realized that the General Conditions of Contract, Special Conditions of Contract and Additional Conditions of Contract, if any, contained in NIT is binding and

the bidder is willing to execute the contract as per the purchaser's terms and conditions of contract.

38. SAMPLES

38.1 Samples of the offered stores, if called for in the NIT, shall be submitted by the bidder free of all charges indicating purchaser's tender number so as to reach the authorized person on or before the last date of submission of bid and without any obligation of the purchaser as regards acceptance/approval, safe custody or safe- return thereof. Each sample submitted must be clearly labeled with the bidder's name and address and tender number. In the event of non-acceptance of the bid, the bidder shall collect the samples at his own expenses within fifteen days from the date of intimation. In case bidder fails to collect such samples within the designated time, the same will be disposed-off by the purchaser and no claim will be entertained from the bidder for the same. Bids without samples shall be rejected, where these were asked for submission in the NIT.

38.2 If the bidder submits the sample with his bid; the same shall not be considered to be part of the stores unless it has been specifically stated in the NIT.

38.3 In case supplies of tendered goods are required as per sample available with the purchaser, the purchaser will provide the sample on submission of a deposit as indicated in the NIT, as a standard for bidding and supply, on request. The contractor may send their representative at an address indicated in the NIT for collection of the sample. The purchaser will not be responsible for any delay in receipt/collection of sample by the bidder. It will be the responsibility of the bidder to return the sample without any damage/deterioration as indicated in the NIT. In the event of non-return of the sample in the desired condition within fifteen days from the date of intimation, the purchaser reserves the right to forfeit the deposit of the bidder.

39. DETAILS OF BANKERS

39.1 The bidder shall submit along with Part-I (Techno-Commercial Part) of the bid account details, IFSC code, the name and address of his bankers for refund of EMD and payment as applicable.

40. SUBMISSION OF DRAWINGS

40.1 The bidder shall upload all drawings pertaining to the stores, wherever called for in the NIT along with Part-I (Techno-Commercial) of bid for correct understanding and evaluation of the bid. Bidder's drawing will form part of the contract only after these are approved by the purchaser.

41. SUB-CONTRACTING

41.1 The contractor in the event of his bid being accepted by the purchaser shall not assign/sublet or delegate the contract or any part thereof without the prior written consent of the purchaser. The contractor may without the purchaser's consent purchase such parts, accessories, raw materials etc. from any of the leading and reputed manufacturers in case he does not normally manufacture such items provided these items comply with the technical specifications. However, the contractor shall be solely responsible for the satisfactory execution of the contract irrespective of the fact whether a part or a portion of the contract has been assigned or sublet by him to a sub-contractor even when such sub-contracting has been done with the prior written consent of the purchaser.

42. SHOP/FACTORY EVALUATION, QUALITY SURVEILLANCE/ INSPECTION AND SUBMISSION OF PROGRESS REPORT

42.1 The purchaser or his technical authorities may at his option and prior to evaluation of the bid depute his inspector or any quality surveillance agency to the factory/workshop/premises of the bidder or contractor to assess and establish the manufacturing capability etc. of the bidder. Similarly, the purchaser may also depute his inspector/quality surveillance agency for inspection of the stores during the various stages of manufacture. In such an event the contractor shall 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 contract.

43. PACKING

43.1 Contractor shall note that packing for shipment shall be in accordance with the instructions outlined in this NIT. Each package shall be limited to the size and weights that are permissible under the existing air, sea or road cargo limits, as the case may be. Even when no packing specification is included in the NIT, it will be contractor's responsibility to provide appropriate packing depending upon the nature of the supply and the transportation and handling hazards. The stores shall be so packed and protected as not to suffer deterioration, damage or breakage during shipment and storage in a tropical climate.

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

43.3 In case of damage of the stores due to inadequate/poor packaging, the purchaser's decision will be final and binding on the contractor. In such cases, the contractor will arrange replacement of such stores at his risk and cost within the delivery date on receipt of written intimation from the purchaser.

44. DEVIATIONS TO PURCHASER'S TECHNICAL SPECIFICATIONS

44.1 If any deviation or substitution from the technical specifications contained in Section "D" to this tender document is involved, such details should be clearly indicated by the bidder in Part-I (Techno-Commercial) and it should be uploaded as an Annexure to Part-I (Techno-commercial) of the bid as otherwise it shall be an admission on the part of the bidder that he will supply the stores as specified by the purchaser. Part-II (Price) should be submitted online in the bid format provided by the purchaser.

45. SETTLEMENT OF COMMERCIAL TERMS AND CONDITIONS OF CONTRACT

45.1 The commercial terms and conditions of sale/contract stipulated in Part-I (Techno-commercial) of the bid submitted by the bidder should be in line with the purchaser's terms and conditions stipulated in the NIT. In case, the bidder does not accept the purchaser's terms and conditions stipulated in the NIT, their bid will be outrightly rejected. The bidder should note that the authority to settle the commercial terms and conditions of contract rests only with the purchaser and any agreement/understanding reached between the bidder and any other authorities will not be valid and binding.

46. PARTICIPATION OF INDIAN/OVERSEAS BIDDER IN THE TENDER

46.1 Indian and overseas bidder can participate in the tender by using digital signature certificate/encryption certificate issued by any licenced certifying authority authorized by Controller of Certifying Authority, India.

47. TERMS OF DELIVERY

47.1 Indian bidders quoting in INR should quote only for safe delivery of stores to the purchaser's consignee.

47.2 Overseas/foreign/Indian bidder quoting in foreign currency should quote on the following INCOTERM basis:-

47.2.1 For air shipment: **FCA at the specified 'Gateway Airport'**, as per list given

47.2.1.1 List of Gateway Airports

Sl. No.	Country	Gateway Airport
1	Argentina	Buenos Aires
2	Australia	Melbourne
3	Austria	Vienna
4	Belgium	Antwerp
5	Canada	Toronto / Montreal
6	China	Beijing
7	Czech Republic	Prague
8	Denmark	Copenhagen
9	Finland	Helsinki
10	France	Paris
11	Germany	Frankfurt
12	Hong Kong	Hong Kong
13	Ireland	Dublin
14	Italy	Rome
15	Japan	Tokyo / Osaka
16	Netherlands	Amsterdam
17	Norway	Oslo
18	Poland	Warsaw
19	Russia	Moscow
20	Singapore	Singapore
21	South Africa	Johannesburg
22	South Korea	Seoul
23	Spain	Barcelona/Madrid
24	Sweden	Stockholm
25	Switzerland	Zurich
26	United Kingdom	London
27	U.S.A.	JFK

47.2.1.2 Since the purchaser has authorized consolidation agents, they will arrange for air-freight from the respective Gateway Airport.

47.2.2 For sea shipment: FOB (Port of despatch)

47.2.2.1 The price quoted shall include the cost of the stores, packing charges, inland transportation charges up to the port of despatch, i.e., major sea ports in country of despatch and loading of the stores on to the ship. The name of the sea port from where the shipment will be made shall also be indicated.

48. AGENCY COMMISSION

48.1 Agency commission payable to the contractor's agents in India, if any, shall be included in the price. Name and address of Indian agent and the percentage of commission payable to them and included in the price shall be clearly indicated. The commission will be paid in INR directly by the purchaser to the Indian agents after final acceptance. The manner and method of payment of agency commission is indicated in the General Conditions of Contract/Special Conditions of Contract.

SECTION 'B'

FORMAT FOR SUBMISSION OF TENDER

Form No: e_IPR-PUR-103A

DECLARATION

Part-I (Techno-commercial) of Tender No:_____Dated_____

Bidder's Bid No:_____ Dated_____

From,
M/S_____
_____
_____

To,
Head- Purchase and Stores Department
Institute for Plasma Research
Near Indira Bridge; Bhat
Gandhinagar-382428 (INDIA),

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, if any

a. I/we hereby agree to execute the contract in accordance with the tender specifications incorporated in Section "D" of the tender document also agree to abide by General Conditions of Contract, Special Conditions of Contract contained in Section "C" of the Tender Document and Additional Conditions of Contract, if any.
b. Purchaser 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 the stores as may be specified in the contract.
c. I/We hereby agree to keep our above mentioned bid valid for the period mentioned in the NIT.
d. Deviations to technical specifications contained in Section "D" of the tender documents are detailed in Annexure "A" of the tender form while deviations proposed to General Conditions of Contract and Additional Conditions of Contract, if any, are detailed in Annexure "B" to this tender.
e. Prices applicable are indicated in the price bid format of the tender.
f. I/We are also uploading herewith all the leaflet/ catalogue, etc. pertaining to the stores offered.
g. If I/We withdraw or modify the bid during the period of validity of if I/We are awarded the contract and I/We fail to submit a PSDBG before the deadline mentioned in the contract, I/We shall be suspended for a period of one year from being eligible to submit bids for contracts with Institute for Plasma Research.

Yours faithfully
Bidder
(Digitally signed or ink signed)

Form No: e_IPR-PUR-103B

DECLARATION

Part-II (Price) of Tender No:_____ Dated:_____
Bidder's Bid No:_____ Dated_____

From,
M/S_____
_____
_____

To,
Head- Purchase and Stores Department
Institute for Plasma Research
Near Indira Bridge; Bhat
Gandhinagar-382428 (INDIA),

Dear Sir,

In response to purchaser's invitation to tender and as per the tender and contract conditions, the prices applicable for the contract as contained in Part-I (Techno-commercial) of our tender are indicated in the price bid format of the tender.

I/We hereby agree to keep our above mentioned bid valid for the period mentioned in the NIT.

If I/We withdraw or modify the bid during the period of validity or if I/we are awarded the contract and I/We fail to submit a PSDBG before the deadline mentioned in the contract, I/we shall be suspended for a period of one year from being eligible to submit bids for contracts with Institute for Plasma Research.

Yours faithfully
Bidder
(Digitally signed or ink signed)

SECTION 'C'

General Conditions of Contract and
Special Conditions of Contract

Form No. IPR-P-100

INSTITUTE FOR PLASMA RESEARCH
(An Aided Institute of Dept. of Atomic Energy, Govt. of India)
NEAR INDIRA BRIDGE, BHAT
GANDHINAGAR-382428

General Conditions of Contract
and Special Conditions of
Contract

Index

Clause No. Clause Title Page No.

SPECIAL CONDITIONS OF CONTRACT (Part-B)

PREAMBLE

While the conditions contained in General Conditions of Contract will apply to all types of contracts, whereas General Conditions of Contract as well as Special Conditions of Contract will apply to contracts for design/ manufacture, supply installation and commissioning of the plant/machinery/equipment/instrument as the case may be.

PART-A

GENERAL CONDITIONS OF CONTRACT

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

The person/s signing or digitally signing the bid or any other document in respect of the bid or contract on behalf of the bidder or contractor shall be deemed to warrant that he has the authority to bind the contractor.

2. DRAWINGS AND SPECIFICATIONS

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

In case any discrepancy is noted in the drawings and/or specifications and 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 his sub-contractor(s).

In case any difference or dispute arises with regard to the true intent and meaning of drawings or specification or in case 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.

All lettering on the drawings is to 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 smaller scale drawings.
The contractor's 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 in writing or as specified in the NIT.

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 etc. what so ever in the drawings or other specifications supplied by him whether such drawings etc. whatsoever have been approved by the purchaser or not, provided that such discrepancies, errors or omissions etc. is not due to inaccurate information or specifications furnished to the contractor on behalf of the purchaser.

3. GENERAL WARRANTY

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

The contractor's bid to execute the contract in accordance with the technical specifications shall be deemed to be an 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 technical specifications of the contract.

4. ALTERATIONS

The purchaser may, in exceptional circumstances, make changes in the drawings, technical specifications and issue additional instructions without altering the contract in any manner provided that the changes will be as far as possible not materially alter the character and scope of the contract.

It shall be lawful for the parties to the contract to alter by mutual consent at any time, the drawings and technical specifications of stores. The stores to be supplied shall be in accordance with such altered drawings and technical specifications from the dates specified by the parties; 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 delivery date 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.

5. PACKING

The contractor shall pack the stores at his own cost sufficiently and properly for transit by air/sea/road as the case may be so as to ensure their being free from loss or damage while in transit to the ultimate destination specified in the contract.

Unless otherwise provided in the contract all containers (including packing cases, boxes, tins, drums and wrappings etc.) 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.

6. INSPECTION

The contractor shall be responsible for and perform all testing required in accordance with the contract and technical specifications included therewith.

The purchaser may at his option depute inspector(s) for inspection of the stores at contractor's works. The contractor shall facilitate such inspection of stores manufactured by him.

The contractor shall give notice of readiness for inspection to the inspector (deputed under Clause 6.2 above) so that the inspector can be present at the requisite time. The contractor shall dispatch stores only after inspector deputed by the purchaser has issued shipping release.

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

The contractor shall provide the drawings, tooling, gauges, instruments etc. and extend all the help required for carrying out the inspection work.

The contractor shall produce an inspection plan to the purchaser's satisfaction notifying check points on the plan. The final inspection shall be conducted as per the approved quality assurance plan.

The contractor shall not supply or deliver the stores unless and until a shipping release or an authorisation for despatch is obtained in the format provided by the purchaser if Pre Despatch Inspection is mentioned in Technical specification. Failure to comply with this instruction as applicable will not only make the contractor ineligible for payment for the supply, but also hold the contractor liable for payment of compensation to the purchaser due to delay in clearance of the stores from the carriers.

If the contractor dispatches stores without obtaining shipping release or authority to dispatch, he will not be entitled to get any payment for such supply, in addition the contractor will pay damages for delayed clearance of the stores from the carrier.

7. SECURITIES

The contractor shall provide the securities in favour of the purchaser in the form of bank guarantees as stated in sub-clauses indicated herein below for a period covering sixty days beyond the completion period mentioned in the contract or such extended period as may be agreed to between the parties, subject to the following conditions:

7.1. Applicable for contracts in INDIAN RUPEE

The bank guarantee should be executed by State Bank of India or any Indian nationalized banker 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 as per the purchaser's format.

7.2. Applicable for contracts other than in INDIAN RUPEE having condition for submission of Bank Guarantee by Foreign Contractor.

The bank guarantee should be executed by State Bank of India or any Indian Nationalized banker Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks) or any Foreign Bank acceptable to the Purchaser. Bank Guarantee drawn from any bank in India shall be on a non- judicial stamp paper of appropriate value whereas Bank Guarantee drawn from Overseas Bank shall be on the Letter Head of the Bank, as per the purchaser's format.

The bank guarantees shall be submitted as per the format available in Annexure.

All bank guarantees are to be sent by the bankers of the contractor directly to the purchaser.

Where the contractor fails to complete the contract within the delivery

date, the contractor shall apply to the purchaser for extension of delivery date of the contract. Such application shall be made before the last date of completion of the contract. The purchaser may at his discretion extend delivery date of the stores under such condition as he may deem fit. All Bank Guarantees so submitted shall also be suitable extended well in time, failing which the purchaser shall have the right to invoke the bank guarantee without prejudice to the terms and conditions of the contract. The contractor shall not supply the material unless the purchaser has extended delivery date of stores in writing

7.3. PERFORMANCE SECURITIES

Contractor shall furnish Performance Security Deposit in the form of bank guarantee for three percent of the value of the contract, including statutory levies, for due performance of the said contract till expiry of warranty period, as per Annexure-I within thirty days from the date of issue of contract in case of Indian Rupee contracts or within thirty days from the date of receipt of Export License by the contractor from respective Government in case of contracts having currency other than Indian Rupee, as the case may be. The Bank Guarantee shall be valid till satisfactory completion of the contract till expiry of warranty period pursuant to General Conditions of Contract, plus a claim period of sixty days from the completion period mentioned in the contract for lodging of claims, if any.

If the contractor fails to provide PSDBG as stated herein above, within thirty days from the date of issue of contract such failure shall constitute a breach of contract and action as deemed fit may be initiated against the contractor.

In case, the contractor fails to fulfill the obligations under the contract; the purchaser shall have the right to invoke and appropriate the PSDBG. This right shall be in addition to and without prejudice to the rights of the purchaser under the terms and conditions of contract

7.4. BANK GUARANTEE FOR FREE ISSUE MATERIAL

Bank Guarantee for Free Issue Material (hereinafter referred to as FIM) (for fabrication of stores at contractor's works outside purchaser's site): The contractor shall submit a Bank Guarantee as per Annexure VIII as applicable to the extent of full value of FIM as security of free issue material issued to the contract or till such time the entire contract is executed and proper account for the FIM is rendered by the contractor to the Purchaser.

8. DELIVERY DATE – TIME IS THE ESSENCE OF CONTRACT

The delivery date stipulated in the contract shall be deemed to be the essence of the contract and the contract must be completed not later than date(s) stipulated therein.

PHASED DELIVERY/MILESTONE

Where the contract envisages phased delivery or completion of milestone, the delivery date for each phase or milestone shall be deemed to be the essence of contract.

Acceptance beyond the delivery date is at the sole discretion of the purchaser and subject to Section C Part A Clause No.10. The contract shall be deemed to be terminated after the expiry of delivery date and subjected to Section C Part A Clause 32.2 and Clause 32.3.

9. ADVANCE INTIMATION OF DELIVERY

Contractors shall send advance intimation to the consignee preferably by e-mail regarding intended delivery of material at least five days prior to the date of delivery of stores to the consignee so as to make proper arrangements for receipt of the stores. If delivery of stores is being carried out by a vehicle, the contractor shall confirm that the driver carries, as on date of delivery, all valid documents, viz., driving license, vehicle registration documents, insurance cover for the vehicle etc. in addition to delivery challan in duplicate along with other documents if any, as per the contract. Failure to carry the valid documents by the driver will result in denial of entry of vehicle inside consignee's premises and the consignee will not be responsible for any consequences thereof.

10. EXTENSION OF DELIVERY DATE

The purchaser will without prejudice to the other rights of the purchaser invoke the following damages for extension of delivery date:

Sl. No.	Delivery Period	Liquidated Damages, Rate per Week	Maximum Amount of Liquidated Damages
1.	Delivery period (as originally stipulated) not exceeding one year	@0.5% of the value of the stores, per week or part thereof	5% of the value of stores.
2.	Delivery period (as originally stipulated) exceeding one year but not exceeding two years.	@ 0.25% of the value of the stores, per week or part thereof.	5% of the value of stores.
3.	Delivery period (as originally stipulated) exceeding two years	@ 0.1% of the value of the stores, per week or part thereof.	5% of the value of stores.

Delivery Period means "The time from date of release of the contract to the date of delivery of stores".

However, the payment of liquidated damages shall not in any way absolve the contractor from any of its obligations and liabilities under the contract.

11. FORECLOSURE OF CONTRACT OR REDUCTION IN SCOPE OF WORK BEFORE DELIVERY DATE

If before the delivery date, the purchaser may at its discretion, decide to abandon or reduce the scope of the contract for any reason whatsoever and does not require the whole or part of the contract to be executed, the purchaser shall give notice of four weeks in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The

contractor shall have no claim for any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the contract in full but which he did not derive in consequence of the foreclosure of the whole or part of the contract.

The contractor shall be paid at contract rates, full amount for part of contract executed and delivered to the purchaser. In addition, a reasonable amount as certified by the purchaser will be paid to the contractor for the stores hereunder mentioned which could not be utilized in the contract to the full extent in view of the foreclosure.

Purchaser shall have the option to take over contractor's materials or any part thereof either bought for execution of the contract or of which the contractor is legally bound to accept delivery from its contractor (for use in the contract). For materials taken over or to be taken over by purchaser, cost of such materials as calculated by purchaser shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.

If any materials supplied by purchaser are rendered surplus, the same except normal wastage shall be returned by the contractor to purchaser at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting of such materials from contractor's site to consignee, if so required by purchaser, shall be paid.

The contractor shall, if required by the purchaser, furnish books of accounts and other relevant documents and evidence as may be necessary to enable the purchaser to certify the reasonable amount payable under Clause 11.2 above.

The reasonable amount payable for the stores shall not be in excess of the cost of the contract remaining incomplete on the date of closure, i.e. total stipulated cost excluding taxes of the contract as per accepted tender less the cost of stores actually delivered and also less the cost of contractor's materials at site taken over by the purchaser as above. Provided always that against any payments due to the contractor on this account or otherwise, the purchaser shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of this contract and any other sums which on the date of termination were recoverable by the purchaser from the contractor under the terms of this contract.

12. INSPECTOR'S AUTHORITY

The inspector, wherever deputed by the purchaser under relevant Clauses of the Contract shall have the power:

to certify that the stores are not in accordance with the specifications provided in the contract owing to the adoption of any unsatisfactory method of manufacture, before any Stores or parts thereof are inspected.

to reject any Stores submitted for inspection or part thereof as not being in accordance with the technical specification provided in the contract.

13. RECTIFICATION AND REPLACEMENT OF DEFECTIVE STORES

If the inspector finds that the contractor has executed any unsound or imperfect work, the inspector shall notify such defects to the contractor in writing with thirty days from the date of delivery 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 between the parties as reasonably necessary, proceed to alter, reconstruct or remanufacture the stores to the requisite standard and technical specifications according to the contract.

In case repair/replacement of defective/rejected stores is necessary and becomes essential to return the stores, to the contractor, where full or part payment has already been made by the purchaser, the contractor shall submit bank guarantee for the value of stores so found defective/rejected as per Annexure-V or VI as may be applicable and valid till receipt and acceptance of repaired/replaced/entire stores within fifteen days of intimation. However, the contractor will not be absolved from his responsibility as specified under Section C Part-A Clause No.8.

14. CONSEQUENCE OF REJECTION

If the stores are rejected by the inspector or consignee at the destination and the contractor fails to make satisfactory supplies within the delivery date, then the purchaser may:

Allow the contractor to submit for inspection of fresh stores in replacement of the rejected, within extended delivery period subject to Section C Part A Clause No. 10, the contractor bearing the cost of freight on such replacement without being entitled to any extra payment on that account. OR

Purchaser may take recourse to Section C Part A Clause 8.4.

15. RECOVERY OF SUMS DUE

Whenever any claim for payment arises out of or under this contract against the contractor, the purchaser shall be entitled to recover the sum by appropriating, in part or whole, the security deposited by the contractor or any payment which at any time may become due to the contractor under this or any other contract with the purchaser. If this sum is 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 amount payable to the contractor under the contract including the security deposit shall be withheld till such claims of the purchaser are finally adjudicated upon and paid by the contractor

16. LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

It is agreed that 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 purchaser 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.

It is further 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 the purchaser until the 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.

17. WARRANTY

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 and acceptance of the last lot of stores under the contract at the ultimate destination stipulated in the contract.

In case any defect or deficiency in the stores supplied by the contractor under the contract appear to be discovered within twelve months from the date of receipt and acceptance of the stores in India, the contractor upon notification of such defects or deficiency by purchaser, shall forthwith take measure to rectify every such defect, deficiency or failure without any cost to the purchaser.

In case the contractor opts for return of stores for rectification/repair at their works, contractor shall furnish bank guarantee for the cost of stores as per Annexure-V or VI (as applicable) valid till acceptance of rectified/repaired Stores. Further the warranty period will get extended for the period the Stores were not available to the purchaser for his use. If the contractor, after such notification, makes default or delay in rectifying all such defects, deficiencies or failure to the satisfaction of the purchaser, the purchaser may take recourse to the remedies provided for in Section C Part-A Clause no. 11 and14.

18. PERMIT AND LICENSES

The contractor shall secure and pay for all licenses and permit at his end which he may be required to comply with all laws, ordinances and regulations etc. 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 indemnify and save the purchaser from against all claims for damages and liability which may arise out of the failure of the contractor to secure and pay for any such licenses and permits and/or to comply fully with any and all applicable laws ordinances and regulations etc.

19. PATENT INDEMNIFICATION

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

In the event of any claim being made or action being taken against the purchaser in respect of the matter referred to in Clause No. 19.1 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 there from.

In the event of any designs, drawing, plans or diagrams or any manufacturing methods or process furnished by the contractor etc. constituting infringement of patent or any other protected rights etc. 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 extent 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.

The provision of the Clause remains effective and binding upon the contractor even after the completion, expiration or termination of the contract.

20. MODE AND DOCUMENTATION OF PAYMENT

20.1. Payment for contracts in currency other than INDIAN RUPEES

Unless otherwise specified elsewhere, payment in full (excluding the amount of the commission included in the price payable directly by the purchaser to the Indian agent) shall be made by wire transfer within thirty days of final acceptance of stores.

The following documents are required to be sent to the purchaser immediately after shipment of consignment:

20.1.1. Bill of Lading/Negotiable Airway Bill evidencing shipment
20.1.2. Invoice for the shipment : Four copies
20.1.3. Packing list : Four copies
20.1.4. Shipping release from inspector or quality surveillance agency nominated by the purchaser for the purpose of inspection: Four copies, if applicable.
20.1.5. Shipping authorization from purchaser wherever required.

The contractor shall send invoice only for the net amount payable to him after deducting the amount of agency commission included in the invoice which would be paid to the Indian agents directly by the purchaser. However the contractor's invoice should separately reflect the amount of commission payable to his Indian agent.

20.2. PAYMENT FOR CONTRACTS IN INDIAN RUPEE

Unless otherwise mentioned elsewhere, payments for the contract will be made after final acceptance of stores and within a reasonable time on submission of following documents.

i) GST compliant invoice in favour of paying authority duly pre-receipted.

ii) Receiving voucher from Stores (RV).

Normally thirty days will be allowed for inspection and payment after receipt of the stores.

21. STATUTORY DEDUCTIONS

The purchaser has the right to make statutory deductions from the payments made to the contractor as applicable on the date of making

such payment as per the provisions of relevant Act or Rules made there under. Appropriate certificate to that effect will be provided by the purchaser's paying authority.

22. AGENCY COMMISSION

The amount of commission included in the price and payable to the Indian agents of the contractor shall be paid in INR directly to the Indian agents by the purchaser on the basis of an Invoice from the Indian agent. "Payment will be released to the Indian agents after receipt and final acceptance of the goods by the purchaser".

INSURANCE FOR CONTRACTS IN CURRENCY OTHER THAN INDIAN RUPEE

Transit insurance from warehouse to warehouse will be arranged by the purchaser through his underwriters unless this responsibility is specifically entrusted to the contractor in any particular case.

23.MARKING

The marking shall generally be as under:

Name and address of the consignee	Head - Stores Section, INSTITUTE FOR PLASMA RESEARCH (An Aided Institute of Dept. of Atomic Energy, Govt. of India) NEAR INDIRA BRIDGE, BHAT GANDHINAGAR-382428
Contract Number and Date	No._____Date_____
Brief Description of Goods	
Weight	
Dimension	
Ultimate Destination	
Port of Discharge	
Package Number	

Each package shall contain a packing note specifying the name and address of the contractor, the number and date of the contract, name and address of the consignee, description of the stores and the quantity contained in such package.

The inspector, wherever deputed by the purchaser under Section C Part-A Clause No. 6 may reject the stores if the same is not packed and/or marked as aforesaid and in case where the packing materials are specifically prescribed, if such materials are not in accordance with the terms of the contract.

24. CODE OF INTEGRITY

No official of a procuring entity or bidder or contractor shall act in contravention of the 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.

25. LAW GOVERNING THE CONTRACT

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

26. JURISDICTION

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.

27. SETTLEMENT OF DISPUTES

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.

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.

28. Arbitration

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.

29. TRANSFER OF OWNERSHIP

29.1 Ownership of the stores supplied by the foreign contractor shall be transferred to the purchaser in accordance with the payment terms or INCOTERMS accepted.

29.2 Ownership of the stores supplied by the Indian contractor shall be transferred to the purchaser when the stores are delivered and accepted by the purchaser

29.3 Transfer of title shall not in any way absolve the contractor from his responsibilities and liabilities under the contract. Notwithstanding the

transfer of ownership of the stores, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the contractor until safe delivery of the stores to the purchaser' site.

INTELLECTUAL PROPERTY RIGHTS

All rights of design documents and drawings, if paid by the purchaser separately or compositely included in the contract cost, will remain with the purchaser and the contractor shall have no claim whatsoever on these rights.

30. EXERCISING THE RIGHTS AND POWERS OF THE PURCHASER

Director, Institute for Plasma Research is the authorized person to deal with, exercise, negotiate on behalf of the purchaser having all the rights, discretions and powers of the purchaser under this contract and any reference to the opinion of the purchaser in the terms and conditions contained in these General Conditions of Contract/Special Conditions of Contract shall mean and be construed as reference to the opinion of any of the persons authorized by him as mentioned in this Clause. All notices on behalf of the purchaser shall be issued by Director, Institute for Plasma Research.

31. TERMINATION OF CONTRACT

In case of non-compliance of any of the Terms and Conditions of the Contract, Purchaser reserves the right to terminate the contract after serving notice to the contractor.

Performance Security, if any, already available shall be forfeited.

In addition to the above, the contractor will be liable to be debarred and/or banned from participation against any tender issued by Institute for Plasma Research, including its regional units, and/or the bid of defaulting contractor is being considered for award of contract of stores.

PART-B

In addition to the General Conditions of Contract contained in Section C Part-A the following Special Conditions of Contract shall apply to contracts for design/manufacture, supply, installation and commissioning of plant/ machinery/equipment/instrument as the case may be . These Special Conditions of Contract in Part-B shall override the General Conditions of Contract, wherever there is any ambiguity/conflict.

SPECIAL CONDITIONS OF CONTRACT

1. RESPONSIBILITY FOR COMPLETENESS

All fittings or accessories which may not be specifically mentioned in the tender specifications of the contract but which are necessary are to be provided by the contractor without any extra charge and the stores comprising plant/machinery/equipment/instruments must be completed in all respect within the delivery date.

2. FINAL TEST

The final tests to ascertain the performance and guarantee shall commence within one month of completion of installation. The contractor will inform the purchaser well in advance the services/facilities required to start the final test, as mentioned in the contract.

3. REJECTION OF DEFECTIVE PLANT

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 during the currency of the contract including warranty period, 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 it comply with the requirement of the contract at the earliest and in any case not later than thirty days from the date of such intimation of the incident. In case the contractor fail to do so within the abovementioned 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 to the same specifications as far as possible and under competitive conditions. The contractor shall be liable to pay to the purchaser the extra cost, if any, of such replacement procured and/or erected as provided for in the contract, such extra cost being the difference between the price paid by the purchaser under the contract for such replacement and the original price admitted in the contract placed with the contractor or the cost as determined by the purchaser out of the price admitted in the original contract, where separate price for such defective/rejected stores is not available in the contract. Contractor shall refund to purchaser any sum paid by the purchaser to the contractor in respect of such defective plant when rejected and no replacement is procured by the purchaser.

4. WARRANTY

The contractor shall provide warranty of stores supplied for a minimum period of twelve calendar months after the stores comprising 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 stores comprising plant/machinery/equipment/instrument) the contractor shall be responsible for any defects that may develop under conditions provided for in the contract and under proper use, arising from the faulty materials, design or workmanshipintheplantorfromfaultyerectionoftheplantbythecontractor,butotherwise 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.

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 until 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 is later. If any defect is not rectified within a reasonable time, the purchaser may cancel the contract or part thereof whose decision will be final and binding on the contractor and the contractor will refund the money so paid to the contractor forthwith without any demur.

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

The contractor shall, give advance notice of not less than twelve months to the purchaser whenever spare parts of the stores are going out of production so that the purchaser may order requirement of spares in one lot or more lots if so desired.

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

The provision of this Clause shall remain effective and binding upon the contractor even after the completion and fifteen years of expiration of the contract or till the stores supplied under the contract is in use by the purchaser, whichever is earlier.

5. ERECTION AND COMMISSIONING

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

Action by the purchaser under the Clause shall not relieve the contractor of his warranty obligations under the contract.

6. TRAINING

The contractor shall, if required by the purchaser, provide facilities for the practical training of purchaser's engineering or technical personnel and for their active association on the manufacturing process through the manufacturing period of the contract/stores, number of such personnel shall be mutually agreed upon.

7. PAYMENT TERMS

7.1. FOR CONTRACTS IN INDIAN RUPEE ONLY

90% of total contract value exclusive of charges for installation and commissioning, if applicable after delivery of all consignment and preliminary inspection by purchaser's inspector on submission of the following:

7.1.1.1. GST compliant invoice in favour of paying authority duly pre-receipted.

7.1.1.2. Original shipping release containing the stamp and signature of the purchaser's inspection authority.

7.1.1.3. Preliminary Inspection Report alongwith Material receipt confirmation documents from Stores.

And balance payment will be released against following documents:

i) Installation, commissioning and training certificate if applicable

ii) Receiving voucher receipt from Stores.

7.2. FOR CONTRACTS IN CURRENCIES OTHER THAN INDIAN RUPEE

Unless otherwise specified elsewhere in the NIT, payment for the stores will be made as follows

90% of total contract value exclusive of charges for installation and commissioning, if applicable by Irrevocable Letter of Credit on submission of the following documents:

i. Bill of Lading/Negotiable Airway Bill evidencing shipment
ii. Invoice for the shipment : Four copies
iii. Packing List : Four copies
iv. Shipping authorization from purchaser wherever required. if applicable,
v. Any other document(s) as specified in the contract.

An advance copy of invoice along with details of documents forwarded through bank should be sent to the Paying Authority mentioned in the contract to enable him to verify the documents and honor the claim without delay.

The contractor shall be responsible to make available to the purchaser the documents which are essential for arranging customs clearance in India. The contractor shall arrange through his bank to have the documents air mailed to the purchase's bank without any delay. He shall also arrange to forward directly to the purchaser, three copies of Airway Bill, along with a copy of the invoice and packing list. If the purchaser incurs any extra expenditure by way of penalty payable to the Airport authorities in India or any other such expenditure due to delay in receipt of shipping documents specified by purchaser, the contractor shall be responsible for making good such extra expenditure incurred by the purchaser.

While the purchaser shall bear the bank charges payable to his bankers in India (State Bank of India) the contractor shall bear all the bank

charges payable outside India including the charges towards advising/amendments, commission.

The contractor shall send invoice only for the net amount payable to him after deducting the amount of agency commission included in the invoice which would be paid to the Indian agents directly by the purchaser in Indian Rupee. However the contractor's invoice should separately reflect the amount of commission payable to his Indian agent.

Balance payment will be made by wire transfer after final inspection, testing, installation, commissioning (where applicable), final acceptance and submission of PSDBG acceptance letter from the Purchaser against following documents.

i. Acceptance Report
ii. Receiving voucher from Stores

8. FORCE MAJEURE

DEFINITION OF FORCE MAJEURE

Force Majeure shall mean any event which is beyond the control of the contractor or the purchaser, as the case may be, which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affects the performance of the contract, such as

war, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war.

rebellion, insurrection, mutiny, usurpation of civil or military government, civil commotion.

embargo, import restriction, confiscation, nationalization, mobilization, commandeering or requisition by or under the order of Central, State Government or Local Authority in India or any other act or failure to act, of any local, state or national government in India

riot

state/region/country wide transporters strike

earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone hurricane, storm, lightning and pressure waves or other natural disaster

nuclear event causing nuclear radiation, radioactive

contamination NOTICE OF FORCE MAJEURE

If either party is prevented, hindered or delayed from or in performing any of its obligations under the contract by an event of force majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen days after the occurrence of such event. A party shall give notice to the other party when it ceases to be affected by the force majeure. Failure to notify the purchaser about occurrence of such event within the time frame specified, the contractor shall have no right to claim any provisions under clause 8.4 below (consequences of force majeure)

DUTY TO MINIMISE THE EFFECT

The party or parties affected by the event of force majeure shall use reasonable efforts to mitigate the effect thereof upon its or their

performance of the contract and to fulfill its or their obligations under the contract

CONSEQUENCES OF FORCE MAJEURE

The party who has given notice of force majeure shall be excused from the performance or punctual performance of its obligations under the contract for so long as the relevant event of force majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The delivery time shall be re- fixed in accordance with Section C Part-A Clause 10, even though such force majeure event may occur after contractor's performance of his obligations has been delayed for other cause. No delay or non-performance by either party hereto caused by the occurrence of any event of force majeure shall

Constitute a default or breach of the contract give rise to any claim for damages or additional cost or expense occasioned thereby; if and to the extent that such delay or non-performance is caused by the occurrence of an event of force majeure. If the performance of the contract is substantially prevented, hindered or delayed for a single period of more than sixty days or an aggregate period of more than one hundred and twenty days on account of one or more events of force majeure during the currency of the contract, the parties will attempt to develop a mutually satisfactory solution.

FORCE MAJEURE AFFECTING SUB-CONTRACTOR

Conditions as enumerated in Section C Part B Clause 8 will be applicable to sub- contractor.

If any sub-contractor is entitled under the contract for Force Majeure on terms additional to or broader than those specified in this Clause, such additional or broader Force Majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

9. LIMITATIONS

Anything in this Contract to the contrary not withstanding

The affected party shall not be relieved from obligations under this contract to the extent any gross negligence of the affected party aggravates the force majeure event; and

Force majeure shall not apply to obligations of either party to make payments to the other party under the contract.

10. HINDRANCES

The contractor is required to maintain hindrance register for reporting hindrance if any, while executing the work, as per Annexure-X

. The contractor shall get record of hindrances in the hindrance register(s) approved/ endorsed by the purchaser. Such hindrance in the work endorsed by the purchaser will only be taken into consideration for granting delivery date re-fixation.

ANNEXURE

BANK GUARANTEE/ HINDRANCE
REGISTER FORMAT

ANNEXURE-I: PERFORMANCE SECURITY BOND

[Note: Bank Guarantee shall be got executed from a Nationalised / Scheduled commercial Bank (Except Co-operative Bank and Grameen Banks) only on non-judicial stamp paper of appropriate value]

Institute for Plasma Research
(Acting through) Director/ Head- Purchase and Stores Department/ Head-Purchase Section
Institute for Plasma Research

1. WHEREAS on or about the (Date of the Purchase Order) M/s._____a Company incorporated under the Companies Act 1956 and having its registered office at _____
(hereinafter referred to as 'The Contractor') entered into an agreement bearing No. _____(hereinafter referred to as 'The Contract'), with Institute for Plasma Research acting through Director/ Head- Purchase and Stores Department/ Head-Purchase Section, Institute for Plasma Research, Bhat, Near Indira Bridge, Gandhinagar-382428. (hereinafter referred to as (Purchaser) for supply of _____(hereinafter referred to as 'The Equipment').

2. AND WHEREAS under the terms & conditions of the contract, the Contractor shall furnish Performance Security Bond for an amount of Rs. _ (Rupees _____only) representing 3% of the total value of the contract in the form of a bank guarantee, in a manner herein contained duly executed by a scheduled/nationalised bank towards satisfactory performance of the contract and performance of the equipment and against any loss or damage caused to or suffered or would be caused to or suffered by the Purchaser by reason of any breach by the said Contractor(s) of any terms and conditions contained in the said agreement. The Performance Security Bond shall be valid till satisfactory completion of Defect Liability Period covering the Warranty/Guarantee period of the equipment as per the terms & conditions of the said agreement.

3. NOW WE, the____(Bank) in consideration of the promises do hereby agree and undertake to pay to the Institute for Plasma Research, (the purchaser) on behalf of the Contractor, the said sum of Rs._____(Rupees _Only), the amount due and payable under the guarantee without any demur, merely on a demand from the Institute for Plasma Research stating that the amount claimed is due by way of loss or damage caused to, or suffered by, the Purchaser by reason of any breach by the said Contractor of any of the terms and conditions contained in the said agreement or by reason of the contractors failure to perform the said agreement or by reason of unsatisfactory performance of the equipment during the Warranty period. Any such demand, made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____ (Rupees _____only).

4. WE undertake to pay to the Purchaser the said sum of ₹_____ (Rupees_____Only), demanded notwithstanding any dispute or disputes raised by the Contractor(s), in any suit on proceedings pending before any Court or Tribunal relating thereto, our liability under this presents being absolute irrevocable and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor shall have to no claim against us for making such payment.

5. WE HEREBY further agree that the decision of the Institute for Plasma Research as to the

amount of damages suffered by the Purchaser by reasons(s) of any breach by the said Contractor or whether the said equipment is giving satisfactory performance or not during the Warranty Period as per the terms and conditions of the said agreement, shall be final and binding on us.

6. AND WE, the_____(Bank) do hereby further agree that our liability hereinunder shall not be discharged by virtue of any agreement between the Purchaser and the Contractor whether with or without our knowledge and/or consent and shall remain in full force and effect during the period that would be taken for the performance of the said agreement or by reason of the Purchaser showing any indulgence or forbearance to the Contractor whether as to payment, time for performance, or any other matter whatsoever relating to the contract, which but for this provision, would amount to discharge of the surety under the law.

7. THIS guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

8. OUR Guarantee shall remain in force until_____and unless a claim under the guarantee is lodged with us within three months from the said date, all rights of the Purchaser under the guarantee shall be forfeited and we shall be relieved and discharged from all our liabilities hereunder.

9. Notwithstanding anything contrary contained in any law for the time being in force or banking practice, this guarantee shall not be assignable or transferable by the beneficiary. Notice or invocation by any person such as assignee, transferee or agent of beneficiary shall not be entertained by the bank. Any invocation of the guarantee can be made only by the beneficiary directly.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-V: BANK GUARANTEE FORMAT FOR RE-EXPORT/RETURN OF REJECTED FOR EQUIPMENT REPAIRS / REPLACEMENT.

(By Indian/Foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira Bridge,
Gandhinagar, Gujarat, India
Pin- 382428

Whereas on or about the_____day of_____20 , M/s._____a company having incorporated their office at_____(hereinafter referred to as 'the Contractor') entered into an Contract No._____dt._____(hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research (Hereinafter referred to as 'the Purchaser') for manufacture and supply of_____Nos. of (hereinafter referred to as the instrument') at a cost of_____(in words).

Whereas as per the terms and conditions of the Contract, the Contractor had delivered to the consignee all the_____Nos. of instruments, out of which_____No./s. of the instrument costing_____(in figure and words) was found defective and not working satisfactorily after its receipt by the consignee and therefore the instrument received from the Contractor was rejected by the Purchaser.

Whereas as per the terms and conditions of the Contract, the Contractor has agreed to either repair or replace the instrument, as is deemed fit, free of cost, to the purchaser within a period of_____months from the date of receipt of the rejected instrument by the Contractor, under the warranty conditions of the Contract.

Whereas, as per the Purchaser policy, the Contractor was required to furnish a Bank Guarantee for full value of the defective instrument/s amounting to_____(in figure and words) as a safeguard to the Purchaser on account of any damage/loss that may be caused or suffered by the Purchaser due to the Contractor's inability/failure to return the instrument duly repaired or supply a new instrument in replacement of the defective instrument within the specified time and also when the instruments lie under the Contractor's custody, control or possession.

Whereas the Contractor, based on the Purchaser's requirement has agreed to furnish such a Bank Guarantee as a safeguard to the Purchaser interest as indicated in para 4 above, valid till the return of the repaired instruments or a replacement thereof, to the Purchaser.

Whereas, we,_____(name and address of the Bank) (herein after referred to as 'the Bank'), in consideration the Purchaser having agreed to despatch the defective instrument to the Contractor's works on freight to pay basis and Contractor having agreed to repair and return the defective instrument duly repaired or arrange free replacement of the defective instrument on freight paid/CIF_____basis, do hereby agree and undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of a sum not exceeding _____(in figure and words.) against any loss or damage that may be caused or suffered by the Purchaser by reason of the Contractor either no returning the repaired instrument or arrange free replacement within a specified time and also when the instrument lie under the custody, control or possession of the Contractor.

We, the Bank, do hereby undertake to pay to the Purchaser, the amount due and payable under this Guarantee, without any demur, merely on a demand from the Purchase Officer, Institute for Plasma Research on behalf of the Purchaser, stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Purchaser by reason of the Contractor either not returning the instrument duly repaired or arrange free replacement to the Purchaser and also when the instrument lie under the custody, control or possession of Contractor. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding _____(in figure and words).

We, the Bank, undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Contractor/s or by agents in any suit or proceeding pending before any' court or tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor/s and the agents shall have no claim against us for making such payment.

And we, the Bank, hereby further agree that the decision of the said Head-Purchase and Stores Department, Institute for Plasma Research as to whether the Contractor has committed breach of any such terms and conditions of the Contract or not and as to the amount of damage or loss assessed by the said Head-Purchase and Stores Department, Institute for Plasma Research on account of such breach would be final and binding on us.

We, the Bank, further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time for performance by the said Contractor from time to time or to postpone for any time or from time to time, any of the powers exercisable by the Purchaser against the said Contractor/s and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor/s or for any forbearance, act or commission on the part of the Purchaser or any indulgence by the Purchaser to the said Contractor/s or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Guarantee will not be discharged due to the change in the constitution of the Bank, the Contractor or the agent.

Our Guarantee shall remain in force until and unless a claim under the Guarantee is lodged with us within three months from that date, all rights of the Purchaser under the Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE VI: BANK GUARANTEE FORMAT FOR RE-EXPORT OF REJECTED EQUIPMENT FOR REPAIRS / REPLACEMENT.
(By local agents of foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the_____day of_____20 , M/s._____, a company having incorporated their office at_____(hereinafter referred to as 'the Contractor') entered into a Contract bearing No._____dt._____(hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research, Gandhinagar, Gujarat, (Hereinafter referred to as 'the Purchaser') for manufacture and supply of Nos._____of (hereinafter referred to as the instrument') at a cost of_____(in figures and words). The Contract recognizes M/s._____(name and address) as the Indian agent of the Principals M/s._____in India.

Whereas as per the terms and conditions of the Contract, the Contractor had delivered to the consignee all the_____instrument costing_____(in figure and words) was found defective and not working satisfactorily after its receipt by the consignee and therefore the instrument received from the Contractor was rejected by the Purchaser.

Whereas as per the terms and conditions of the Contract, the Contractor has agreed to either repair or replace the instrument, as is deemed fit, free of cost, to the purchaser within a period of _____months from the date of receipt of the rejected instrument by the Contractor, under the warranty conditions of the Contract.

Whereas, as per the Purchaser policy, the Contractor was required to furnish a Bank Guarantee for full value of the defective instruments amounting to (in figure and words) as a safeguard to the Purchaser on account of any damage/loss that may be caused or suffered by the Purchaser due to the Contractor's inability/failure to return the instrument duly repaired or supply a new instrument in replacement of the defective instrument within the specified time and also when the instruments lie under the Contractor's. custody, control or possession. As the Indian agent has agreed to furnish the Bank Guarantee on behalf of the Principal in this Contract, M/s._ ____is required to execute the Bank Guarantee.

Whereas the Contractor, based on the Purchaser's requirement has agreed to furnish such a Bank Guarantee as a safeguard to the Purchaser interest as indicated in para 4 above, valid till the return of the repaired instruments or a replacement thereof, to the Purchaser.

Whereas, we, (the name and address of the Bank) (herein after referred to as 'the Bank'), in consideration of the Purchaser having agreed to despatch the defective instrument to the Contractor's works on freight to pay basis and Contractor having agreed to repair and return the defective instrument duly repaired or arrange free replacement of the defective instrument on freight paid /CIF _____basis, do hereby agree and undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of a sum not exceeding _____(in figure and words) against any loss or damage that may be caused or suffered by the Purchaser by reason of the Contractor either not returning the repaired instrument or arrange free replacement within a specified time and also when the instrument lie under the custody, control or possession of the Contractor.

We, the Bank, do hereby undertake to pay to the Purchaser, the amount due and payable under this Guarantee, without any demur , merely on a demand from the Purchase Officer, Institute for Plasma Research, stating that the amount claimed is due by way of loss or damage caused to

or would be caused to or suffered by the Purchaser by reason of the Contractor either not returning the instrument duly repaired or arrange free replacement to the Purchaser and also when the instrument lie under the custody, control or possession of Contractor. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding_____(in figure and words).

We, the Bank, undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Contractor/s or by agents in any suit or proceeding pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor/s and the Indian agents shall have no claim against us for making such payment.

And we, the Bank, hereby further agree that the decision of the said Head-Purchase and Stores Department as to whether the Contractor has committed breach of any such terms and conditions of the Contract or not and as to the amount of damage or loss assessed by the said Head-Purchase and Stores Department, Institute for Plasma Research on account of such breach would be final and binding on us.

We, the Bank, further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time for performance by the said Contractor from time to time or to postpone for any time or from time to time, any of the powers exercisable by the Purchaser against the said Contractor/s and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor/s or for any forbearance, act or commission on the part of the Purchaser or any indulgence by the Purchaser to the said Contractor/s or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Guarantee will not be discharged due to the change in the constitution of the Bank, the Contractor/s or the agents.

Our Guarantee shall remain in force until_____and unless a claim under the Guarantee is lodged with us within three months from that date, all rights of the Purchaser under the Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-VII: BANK GUARANTEE FORMAT FOR SUPPLY OF FREE ISSUE MATERIAL
(By Indian/Foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the_____(date), the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research,(hereinafter referred to as the Purchaser) has entered into a Contract bearing No._____Dated_____for manufacture, inspection, testing and safe delivery of_(herein after referred to as the equipment) with M/s. _____having their office at_____(hereinafter referred to as the Contractor.)

And whereas in terms of the above said agreement, the Purchaser is required to supply free issue materials costing Rs._____as listed out in the agreement for the manufacture of the equipment at the Contractor's site, and that the Purchaser has agreed to authorise the Contractor to collect the free issue materials from the Purchaser's site subject to the Contractor furnishing a Bank Guarantee for Rs._____in a manner herein specified towards the safeguard of free issue materials.

Now, we_____(bank) in consideration of the Purchaser having agreed to authorise issue of free issue material for collection by the Contractor, hereby undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of the full value of the free issue material till such time the materials are lying under the custody/possession/control of the Contractor and till the equipment along with balance material, if any, are received by the Purchaser after manufacture of the equipment.

We,_____(bank) do hereby undertake to pay to the Head-Purchase and Stores Department, Institute for Plasma Research, the amount due and payable under this Guarantee without any demur, merely on a demand from the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Purchaser stating that the amount claimed is due by way of loss, destruction, deterioration or damage caused to or suffered by the Purchaser to the purchaser's material thereby resulting in a loss to the Purchaser while they are lying under the Contractor's custody, possession or control or on account of the Contractor's failure to fulfill any of the contractual obligations.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. _____

We,_____(Bank) undertake to pay to the Purchaser any money so demanded

notwithstanding any dispute or any disputes raised by the Contractors in any suit or proceeding pending before any court of Tribunal relating

thereto our liability under this present being absolute and unequivocal. They payment so made by us under this Bond shall be a valid discharge of our liability for payment thereunder and the Contractors shall have no claim against us for making such payments.

We,_____(Bank), also agree that the decision of the Purchase Officer, Institute for Plasma Research, Gandhinagar, Gujarat as to whether the Contractor has caused any loss/destruction or deterioration or damage to the Purchaser's material while these are lying under his custody/possession/control from whatever cause arising as also on the quantum of damage suffered by the Purchaser shall be final and binding on us.

We,_____(bank) further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time for performance by the said Contractors from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said Contractors and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractors or for any forbearance, act or omission on the part of the said Purchaser or any indulgence by the Purchaser to the said Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have the effect of so relieving us.

This Guarantee will not be discharged due to change in the constitution of the Bank or the Contractors.

Our Guarantee shall remain in full force until_____and unless a claim under the guarantee is lodged with us within six months from that date all rights of the Purchaser under the guarantee shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-VIII: BANK GUARANTEE FORMAT FOR FIM
(Foreign Currency Contract)
(to be executed by the Indian Agent)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the _____ day of _____ 200 , M/s. _____, a company having incorporated their office at _____ (hereinafter referred to as 'the Contractor') entered into a Contract bearing No. _____ dt. _____ (hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research (Hereinafter referred to as 'the Purchaser') for manufacture and supply of Nos. _____ of (hereinafter referred to as the instrument') at a cost of _____ (in figures and words). The Contract recognises M/s. _____ (name and address) as the Indian agent of the Principals M/s. in India.

And whereas in terms of the above said agreement, the Purchaser is required to supply free issue materials costing Rs. _____ as listed out in the agreement for the manufacture of the equipment at the Contractor's site, and that the Purchaser has agreed to authorise the Contractor to collect the free issue materials from the Purchaser's site subject to the Contractor furnishing a Bank Guarantee for Rs. in a manner herein specified towards the safeguard of free issue materials. As the Indian agent has agreed to furnish the Bank Guarantee on behalf of the Principal in this Contract, M/s. _____ is required to execute the Bank Guarantee.

Now, we _____ (bank) in consideration of the Purchaser having agreed to authorise issue of free issue material for collection by the Contractor, hereby undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of the full value of the free issue material till such time the materials are lying under the custody/possession/control of the Contractor and till the equipment along with balance material, if any, are received by the Purchaser after manufacture of the equipment.

We, _____ (bank) do hereby undertake to pay to the Head-Purchase and Stores Department, Institute for Plasma Research, the amount due and payable under this Guarantee without any demur, merely on a demand from the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Purchaser stating that the amount claimed is due by way of loss, destruction, deterioration or damage caused to or suffered by the Purchaser to the purchaser's material thereby resulting in a loss to the Purchaser while they are lying under the Contractor's custody, possession or control or on account of the Contractor's failure to fulfill any of the contractual obligations.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. _____

We,_____(Bank) undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or any disputes raised by the Contractors in any suit or proceeding pending before any court of Tribunal relating thereto our liability under this present being absolute and unequivocal. They payment so made by us under this Bond shall be a valid discharge of our liability for payment thereunder and the Contractors shall have no claim against us for making such payments.

We,_____(Bank), also agree that the decision of the Head-Purchase and Stores Department, Institute for Plasma Research, Gandhinagar, Gujarat as to whether the Contractor has caused any loss/destruction or deterioration or damage to the Purchaser's material while these are lying under his custody/possession/control from whatever cause arising as also on the quantum of damage suffered by the Purchaser shall be final and binding on us.

We,_____(bank) further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time for performance by the said Contractors from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said Contractors and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractors or for any forbearance, act or omission on the part of the said Purchaser or any indulgence by the Purchaser to the said Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have the effect of so relieving us.

This Guarantee will not be discharged due to change in the constitution of the Bank or the Contractors.

Our Guarantee shall remain in full force until_____and unless a claim under the guarantee is lodged with us within six months from that date all rights of the Purchaser under the guarantee shall be relieved and discharged from all liabilities thereunder.

Dated the_____day of_____202_
For_____
(Indicate the Name of bank)

ANNEXURE-X: FORMAT FOR HINDRANCE REGISTER

Sl. No.	From	To	Nature of Hindrances in execution of Contract	Remarks with signature of Contractor	Remarks with Signature of Purchaser's representative

(To be printed in letter head)

Annexure-XI

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/21-22/012** dated **31-08-2021.** 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

(To be printed in letter head)

ANNEXURE-XII

Annexure to Bid Form: Eligibility Declarations

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

Tender No. IPR/

Tender Tile:
Bidder's Name: _____
(Address and contact details) Date:_____
Bidder's Reference No._____

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

"We have read the clause regarding restrictions on procurement from a 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 a 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 future 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)

SECTION 'D' :

TECHNICAL SPECIFICATIONS OF STORES

AND

DRAWINGS

Please see attachment to the tender

SECTION 'E' :

PRICE SCHEDULE

Please see attachment to the tender

Annexure-IV

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

ADDITIONAL CONDITIONS OF CONTRACT against

IPR Tender No: IPR/TN/PUR/TPT/ET/22-23/002 Dated: 08/06/2022

Following clauses are deleted in Form No. m_IPR-P-103

(Section–A)

a) 47.2

Following clause is modified in Form No. e_IPR-PUR-103

7 **VALIDITY OF BIDS**

7.1 Bids shall be kept valid for acceptance for a period till **120 Days** from the date of **Opening of PART-I (Technical Bid)**. Bids with shorter validity period shall be rejected without any notice to the bidder.

Following clauses are deleted in Form No. IPR-P-100

PART-A

a) 7.2
b) 20.1
c) 22
d) 29.1

PART-B

a) 7.2

Following clause is modified in Form No. IPR-P-100

PART–A

29.2 Ownership of the stores supplied by the contractor shall be transferred to the purchaser when the stores are delivered and accepted by the purchaser.

Following clause is modified in Form No. IPR-P-100

PART–B

7.1 The Clause Sr. No. 7.1 under heading Payment Terms of Section-B "General Conditions of Contract" of Form No. e_IPR-PUR-103 (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) 10% basic price of supply portion i.e. Item Sr. No. 1.01 of Price-Schedule will be paid as an advance against on submission of Bank Guarantee for an equivalent amount 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-Operating and Grameen Banks) on a non-judicial stamp paper of appropriate value valid till delivery of the system and on receipt of Proforma Invoice in triplicate.

b) 10% basic price of supply portion i.e. Item Sr. No. 1.01 of Price-Schedule will be paid as an advance against approval of drawings/design and on submission of Bank Guarantee for an equivalent amount 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-Operating and Grameen Banks) on a non-judicial stamp paper of appropriate value valid till delivery of the system and on receipt of Proforma Invoice in triplicate.

a) 60% of basic price of Item Sr. No. 1.01 of Price-Schedule + 100% of all applicable taxes will be paid against delivery of complete system at IPR site, Bhat, Gandhinagar, its physical verification by representative of IPR and on receipt of Invoice in triplicate.

b) 10% of basic price of Item Sr. No. 1.01 of Price-Schedule and 80% of Item Sr. No. 1.02 of Price-Schedule + 100% of all applicable taxes after completion of installation at IPR site.

c) 10% of basic price of Item Sr. No. 1.01 of Price-Schedule and 20% of Item Sr. No. 1.02 of Price-Schedule against successful testing, commissioning and acceptance of system at IPR site alongwith final invoice.

Following Annexures are deleted in Form No. IPR-P-100

Annexure – IX

Following Annexures are added in Form No. IPR-P-100

Annexure-XIII (**COMMERCIAL TERMS & CONDITIONS)**

Vendor/ Bidder should upload the duly filled (signed and stamped) copy of commercial bid (unpriced) as per Annexure-XIII

IMPORTANT NOTE:

1) **QUOTATIONS ARE INVITED IN INDIAN CURRENCY ONLY.**
2) **QUOTATIONS RECEIVED OTHER THAN "INR" QUOTE SHALL SUMMARILY BE REJECTED.**
3) **OFFERED PRICE SHOULD BE EXCLUSIVE OF APPLICABLE GST.**
4) **PARTIAL OFFER IS NOT ACCEPTABLE. OFFER RECEIVED FOR THE PARTIAL ITEM SHALL BE SUMMARILLY BE REJECTED**
5) **RATE MENTIONED AS "0" IN PRICE SCHEDULE SHALL BE CONSIDERED AS "WITHOUT ANY CHARGE/ FREE OF COST".**

IPR Enquiry/ Tender No. & Date	**IPR/TN/PUR/TPT/ET/22-23/002 dated 08 June, 2022**

COMMERCIAL TERMS & CONDITIONS

IPR Enquiry/Tender No	
Item Description	**Design, Engineering, Fabrication, Supply inlcuding unloading, installation & commissioning, testing and site accceptance at IPR site of WATER POLISHING SYSTEM comprising DM plant, EDI units with oxygen removal (membrane contactor type) system comprising of all necessary equipment, interconnected piping, valves with actuators, support structures, instrumentation with electricals (MCC/LPBSs) , power and instrumentation cabling, wiring, earthing, and PLC based monitoring Data Acquisition and Control System (SCADA) comprising of software and hardware, including construction of waste water disposal tank and minor civil works as per the details mentioned in technical specifications of the tender document – 1 Set.**

Sl. No.	PARTICULARS	REMARKS
I	**Name of the Bidder**	
II	**Bidder Bid No & Date**	
III	**Postal address**	
IV	**Contact 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	Price Term for Supplies offered in Indian Currency	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**	

	issuance of GST Concessional Certificate you shall charge GST on Supply Portion @5% only **Goods and Service Tax for Service items: As applicable**	
4	**Delivery period:** Refer tender terms	
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. 10 of Form No. IPR-P-100 attached with the tender/enquiry is acceptable to you	
7	Terms of Payment:- Please confirm payment terms mentioned in the tender document is acceptable to you Refer "**Annexure-IV" for details**	
8	Guaranty / Warranty:- Refer tender terms	
9	**Validity of offer/quotation**:- Refer tender terms	
	QUESTIONNAIRE TO BE FILLED BY BIDDER IN AND SENT ALONG WITH OFFER DULY SIGNED	Accepted/ Not Accepted
10	**Performance Security:** In the event of a purchase order/contract vendor has to provide Performance Security (PSDBG) as per tender terms, wherever applicable shall be submitted.	
11	**Free Issue Material:** Successful tenderer will have to arrange insurance/ Bank Guarantee 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.	

Yours faithfully
Bidder
(Digitally signed or ink signed)

SECTION 'D' :

TECHNICAL SPECIFICATIONS OF STORES

AND

DRAWINGS

Institute for Plasma Research

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

QUALIFYING REQUIREMENTS

ITEM DESCRIPTION	**Design, Engineering, Fabrication, Supply inlcuding unloading, installation & commissioning, testing and site accceptance at IPR site of WATER POLISHING SYSTEM comprising DM plant, EDI units with oxygen removal (membrane contactor type) system comprising of all necessary equipment, interconnected piping, valves with actuators, support structures, instrumentation with electricals (MCC/LPBSs) , power and instrumentation cabling, wiring, earthing, and PLC based monitoring Data Acquisition and Control System (SCADA) comprising of software and hardware, including construction of waste water disposal tank and minor civil works as per the details mentioned in technical specifications of the tender document**

Sr. No.	Detailed Criteria	Documents required to submit / upload
1	Bidder Should have minimum average annual turnover of Rs 4 Crores (Rs. Four Crores) of any 3 (Three) financial years during the last 5 (Five) years ending 31st March, 2021 i.e. FY2016-2017, FY2017-2018, FY2018-2019, FY 2019-2020 and FY 2020-2021	***Bidder should submit Audited annual account or CA certificate of any 3(Three) financial years during the last 5 (Five) years ending 31st March, 2021 (i.e. FY 2016-2017, FY 2017-2018, FY 2018-2019, FY 2019-2020 and FY 2020-2021) as a proof***
2	Minimum value of similar* work/s completed within the last Seven years from the date of tender publication shall be as per following: 1. At least one work with minimum value of Rs. 4.5 crores OR 2. At least two works with minimum value of Rs. 3.0 crores each OR 3. At least three works with minimum value of Rs.1.5 crores each ***Definition of "Similar Work/s":** **"Should have satisfactorily completed with scope of SITC (Supply, Installation, Testing and Commissioning) work consisting of at least One number of Water Polishing System (WPS) for High Purity Water Application (≤1 µS/cm Conductivity), with a single stream production capacity of minimum 5CuM/Hr"**	Bidder should submit following documents as proof: (i) Copy of work order with complete technical details including BoQ fulfilling the requirements mentioned under "similar work/s" (ii) Copy of completion certificate from the purchaser duly certified by the Engineer-in-Charge or Consultant/Architect (iii) Provide the TDS certificate/s - 26AS/16A of qualifying PO/WO, if the qualifying PO/WO was awarded by a private company

Note:

1	The bidder shall be single entity, who fulfills the Eligibility criteria on their own (i.e. Works carried under joint ventures/ consortium shall not be considered), shall only be eligible to apply
2	Bidders meeting the Eligibility Criteria as mentioned in the table shall only be considered as "eligible bidders" and will be shortlisted for further evaluation.
3	Relevant documents shall be submitted as an evidence of fulfilment of eligibility criteria. However, meeting the eligibility criteria in itself does not automatically qualify through the technical bid evaluation process.
4	The response to tender without submission of proof of above points will summarily be rejected without further communication
5	Original documents shall be produced for verifications, if required
6	IPR keeps the right to contact the customers and/or visit those plants referred by eligible bidders.

TENDER DOCUMENT
for

Design, Engineering, Fabrication, Supply inlcuding unloading, installation & commissioning, testing and site accceptance at IPR site of WATER POLISHING SYSTEM comprising DM plant, EDI units with oxygen removal (membrane contactor type) system comprising of all necessary equipment, interconnected piping, valves with actuators, support structures, instrumentation with electricals (MCC/LPBSs) , power and instrumentation cabling, wiring, earthing, and PLC based monitoring Data Acquisition and Control System (SCADA) comprising of software and hardware, including construction of waste water disposal tank and minor civil works for Cooling Water Plant of New Laboratories"

(Please note that the bidder should sign on all pages)

INSTITUTE FOR PLASMA RESEARCH
NEAR INDIRA BRIDGE,
BHAT, GANDHINAGAR-382 428
GUJARAT
INDIA

CONTENTS

List of Tables

LIST OF ANNEXURES- TECHNICAL DATA SHEET

ABBREVAITIONS

CPVC	: Chlorinated Poly Vinyl Chloride
CSRL	: Carbon Steel Rubber Lined
DAC	: Data Acquisition and Control
DM	: Demineralized
DNBCH	: Diagnostic Neutral Beam Chilled water
DNBHP	: Diagnostic Neutral Beam High Pressure
DNBLP	: Diagnostic Neutral Beam Low Pressure
DO	: Dissolved Oxygen
EDI	: Electro De Ionization
FAT	: Factory Acceptance Test
GAD	: General Arrangement Drawing
GUI	: Graphical Users Interface
GTAW	: Gas Tungsten Arc Welding
HDG	: Hot Dipped Galvanized
HOS	: Height On Surface
HMI	: Human Machine Interface
HRS	: Heat Rejection System
HSC	: Horizontal Split Casing type pump
ICECRH	: Ion Cyclotron and Electron Cyclotron Resonance Heating
IPR	: Institute for Plasma Research
ISA	: International Society of Automation
ISO	: International Organization for Standardization
ITER	: International Thermonuclear Experimental Reactor
KW	: Kilowatt, electrical power measurement unit
LCD	: Liquid Crystal Display
LDPE	: Low Density Poly Ethylene
LED	: Light Emitting Diode
LPBS	: Local Push Button Station
MIP	: Manufacturing and Inspection Plan
MCC	: Motor Control Center
MSRL	: Mild Steel Rubber Lined
MOC	: Material of Construction
MPR	: Motor Protection Relay
MS	: Mild Steel
OEM	: Original Equipment Manufacturer
OLR	: Over Load Relay
PCB	: Printed Circuit Boards
PFD	: Process Flow Diagram
PID	: Process and Instrumentation Diagram
PLC	: Programmable Logic Controller
PSF	: Pressure Sand Filter
PVC	: Poly Vinyl Chloride
RTD	: Resistance Temperature Detector
SAT	: Site Acceptance Test
SCADA	: Supervisory Control And Data Acquisition
SLD	: Single Line Diagram

SMAW	: Shielded Metal Arc Welding
SOQ	: Schedule of Quantities
SPP	: Single Phase Preventer
SS	: Stainless Steel
TEFC	: Totally Enclosed Fan Cooled
UPS	: Uninterrupted Power Supply
VFD	: Variable Frequency Drive
WPQR	: Welding Procedure Qualification Record
WPS	: Water Polishing System
WPU	: Water Polishing Unit
XLPE	: Cross Linked Polyethylene

1 SECTION-I: SCOPE OF WORK AND DELIVERABLES

1.1 SCOPE OF WORK

The scope of work covered under this tender includes design, supply, fabrication, installation, testing & commissioning of the Water Polishing System (WPS) for Cooling Water Plant of New Laboratories as per the application mentioned, and shall be in general, as per the scope.

The scope of work to be carried out under this contract is illustrated in conceptual sketch and technical Specifications. The contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the directions of and to the satisfaction of IPR/IPR Engineer In-charge. The contractor shall furnish all labor, materials and equipment as per technical specification / SOQ and specified otherwise, transportation and incidentals necessary for supply, installation, testing and commissioning of a complete system as described in the specifications and as shown in the conceptual sketch/drawing. This also includes any materials equipment, appliances and incidental work not specifically mentioned herein or not on the Drawings / Documents as being furnished or installed, but which are necessary and customary to make a complete installation. The bidder must cover all the items/works covered under the scope of work.

The main scope of work of the contractor includes, but not limited to, the following tasks:

a. Design, preparation of the drawings and documents for whole WPS including control philosophy, optimization studies, calculations and analysis as required, technical specifications, datasheets etc. Also, preparation of equipment manufacturing drawings, manufacturing inspection plan, detailed procedure for erection, installation, commissioning and testing, operating procedure for each of the equipment and integrated system, operation and maintenance manuals for whole system is in the scope of the contractor. The covered scope under this contract is detailed in technical section.
b. All the systems, structures and components required for proper functioning and safety of the systems are included in the scope of Design, procurement and works, unless specifically excluded in scope of supply and works.
c. Supply, installation, testing and commissioning of the equipment, components, and other items of WPS as indicated in the technical specification/ SOQ based on preliminary design and is indicative and may undergo changes based on the final design to be carried out by the contractor.
d. The contractor shall also study the space available inside plant room for all equipment installation as well as outside plantroom for system equipment's installation. Accordingly, they may propose/refine the equipment, piping and instrumentation layout wherever required without affecting the required flow and pressure requirements in each water supply line of users.
e. All the changes/modifications on the design and layout carried out by contractor are subjected to approval by the Purchaser. However, the contractor may note that achieving the desired technical specification is sole responsibility of the contractor.
f. Contractor shall generate PFDs, P&IDs, Isometric drawings for piping, detailed engineering drawings, Electrical load list, instrumentation list, control logic notes for PLCs, SLDs, cable

schedule, equipment General Arrangement Drawing (GAD) for all required items and submit to the Purchaser for approval before the procurement of items under this package.

g. Preparation of final technical specification and technical data sheets of all equipment based on final design.
h. Finalizing the Bill of Quantities based on the final design.
i. Optimization of overall project schedule of the contract and provide the summarized schedule in excel or in any recommended software like primavera.
j. Procurement of pipes and pipe fittings such as elbows, tees, reducers, purge tapings, flanges, valves, actuators, strainers, gaskets, studs, nuts & bolts, washers, instrumentation, non-conducting flexible hose with fittings, flexible bellows etc. for WPS shall be in the scope of the contractor. The interconnecting piping between equipment, drain piping, make up and overflow piping up to the nearest point and whole WPS piping network shall be as per relevant standards.
k. Please note that Water cooling System (WCS) shall be installed inside the CWS plant room within the space allocated. Necessary interfaces shall be addressed and resolved under this scope of contract by the contractor. Accordingly, contractor is responsible to carryout interconnected piping and cabling, instrumentation as well as design and procurement of DACs compatible with Cooling Water Plant's operation requirement.
l. Procurement of equipment/ items required to complete WPS project comprising of various feed pumps with accessories, filter units, DM plant having Cation-Anion Units, Degasser tower and storage tank with air blowers, MB plant, EDI unit, Oxygen control units of membrane contactor type with vacuum pumps, storage tanks, VFDs, Electrical and instrumentation panels, Data acquisition and control systems, power and control cablings, instruments and controls etc.
m. On-site/off-site fabrication and erection of piping and fittings, piping supports, instrumentation and other enumerated materials given under the scope of supply shall be as per approved manufacturing drawings. All foundation bolts, matching flanges, nut & bolts, approach ladder, operating P\platform required for equipment/tanks/filter unit shall be in the scope of this contract.
n. Providing Civil works such as RCC/PCC support structure for foundation/ pedestals of main equipment, skid, RCC blocks/footings wherever required for the erection of support structures for entire piping layout as per the approved drawings is under the scope of contractor. Excavation, filling and making the ground to the normal for foundation/pedestal/civil work, shall be under the scope of contractor. Prior intimation and approval are required for any such work in IPR's premises. Construction of suitable size (min. $10M^3$) of waste water disposal tank with acid proof tiling/lining on all walls/floor and slabs as per the design/ site requirement, providing acid proof tiling work on the floor below equipment wherever required as per design/site requirement shall be in the scope of contractor
o. Contractor shall submit all quality documents, material certificates, test certificates and calibration certificates for all the components, raw materials and instrumentations respectively.
p. Contractor shall perform inspection and testing for the acceptance of all fabricated pipelines and joints as per relevant section of the tender documents
q. Contractor has to design and provide power cabling to the signal conditioning setup from nearest power point available in the lab.

r. Contractor needs to carry out hydrotest of integrated piping system as per specifications with pressurized water at Site.
s. Contractor is responsible for safe delivery, loading and unloading, transportation storage and shifting on site for all the components, equipment, materials, systems required during execution of this contact. The safety and security of all components, equipment, materials, systems delivered at IPR site shall be the sole responsibility of the contractor
t. The contractor shall provide all the necessary arrangements like temporary pipe connections, supports, other materials, tools, equipment, instruments, scaffoldings, other services and labor required to perform the acceptance test of the WPS at factory as well at IPR site

Notes:

i. The entire work shall be carried out in accordance with these terms and conditions and generally as per the scope, technical specifications, data sheets in the documents. The liability of the contractor shall not be limited to the scope of work mentioned, but shall also extend to achievement of the desired quality as per the design, as well as complete, safe and satisfactory operation of the system as approved by the Engineer In-Charge. Any equipment/component/instruments, material and labor required in order to achieve the completeness of the WPS plant as above shall be deemed to be included in the scope of the contractor without any extra cost to the client.
ii. If any kind of major or minor fault will arise during warranty period, then original parts/spares/components (including all kind of consumables, gas, oil etc.) from the OEM (Original equipment manufacturer) shall be used to set right the fault and bring back the system in the operation condition.

iii. For defects noticed during the warranty period, replacement/ rectification should be arranged free of cost (including supply and procurement of spares, taxes, labor charges, breakdown maintenance and transport charges from site to the manufacturer's works and back and free repair/adjustment etc.) within a reasonable period of such notification from the purchaser.

1.2 DOCUMENTS (DELIVERABLES) BY CONTRACTOR

Table below shows the documents that are minimum to be delivered during the execution of the contract phase by the contractor which need to be approved by the Purchaser. There shall be other documents/reports/drawing/diagrams/manual required to be provided during the execution, testing and final acceptance by the contractor (apart from the listed in Table-2), which shall be finalized during detailed engineering/design phase.

Table 1: Deliverables

1	Quality Plan
2	Detail schedule of project execution.

3	PFDs and P&IDs
4	2D CAD isometric/GA drawings of water distribution network
5	SLD of electrical line distribution for all instrumentations.
6	Detailed SOQ, tools and Equipment required for fabrication of entire WPS work.
7	Technical Compliance report along with makes for the items under scope of supply as per relevant annexure
8	Manufacturing and Inspection Plan (MIP)
9	Test Certificates/ Calibration Certificates/ Manufacturer's Warranty of all supplied equipment/components/instruments and controls/materials etc.)
10	As built isometric & GA Drawings along with Schedule of Quantity (SOQ) after commissioning. All drawings should be submitted in native editable file format such ".dwg" etc. as well as in pdf format
11	Factory & Site Acceptance Test (FAT& SAT) Report
12	Operation and maintenance Manual

1.3 EXCLUSIONS

a. Major civil works such as construction of plant building, construction of RCC slab/floors etc. are excluded from the scope of the contractor

1.4 FREE ISSUE MATERIALS

The Purchaser will provide free power and water for the construction, testing and commissioning of WPS at site. The Purchaser will provide main incoming power to main Electrical panel within the plant room. Necessary power to carry out the work under the contract should be tapped from the main breaker.

2 SECTION III: DESIGN PHYLOSOPHY

2.1 INTRODUCTION

IPR intend to install Water Polishing System (WPS) for our Cooling Water System (CWS) for New Laboratories. This CWS is meant for cooling various experimental components set up in Lab building such as ICRH, ECRH, DNB and few small systems. Some of the testing components are critical components on the basis of very stringent water quality i.e. low dissolved oxygen and very low ionic conductivity for which this WPS shall be designed and installed.

The CWS is having below five loops which require controlled water chemistry:

1. ICECRH Loop (Ion Cyclotron and Electron Cyclotron Resonance Heating Loop)
2. DNBHP Loop (Diagnostic Neutral Beam High Pressure Loop)
3. DNBLP Loop (Diagnostic Neutral Beam Low Pressure Loop)
4. DNBCH Loop (Diagnostic Neutral Beam Chilled water Loop)
5. IPRCH Loop (IPR Chilled water Loop)

These Cooling loops are dedicated closed loop cooling water circulating system for absorbing heat from the ITER Test facility components. Loop No. 4 &5 have been combined for water polishing system. The makeup, first filling of water in the loops and control of water chemistry during continuous operation of cooling loops shall be carried out through Water Polishing Unit under the present scope of work.

The main components of the cooling water loops are Centrifugal pumps (with motor and VFD), Plate type heat exchanger, interconnected piping, fittings, valves and actuators, pressurizer etc. forming closed water circulating cooling loops.

2.1.1 BASIS OF DESIGN

The system design / engineering details given in this tender may be treated as indicative. The contractor shall validate, redesign / modify / optimize the system or part of the system design if required. All such changes / modifications are subject to the approval by the Purchaser.

The operation of cooling water circulation system shall be on the basis of experiments being conducted. It is envisaged that the WPU is required to run continuously for one week with 2 shifts in operation and 1 shift as silent shift. The experiment may run for 2 continuous weeks in this mode. There are chances that the WPU is required to run in above way for consecutive 3-4 months and then it is required to put off for another 3-4 months' time.

2.1.2 SITE CONDITION

1. **Site:**
   Institute for Plasma Research

Opp. Bhat village, Near Indira Bridge, Gandhinagar, Gujarat. -382 428.

2. **Site Location:**

4 km away from Ahmedabad Airport.
Nearest port: Mumbai / Kandla/Mundra
Nearest Railway station: Ahmedabad.

2.1.2.1 OUTDOOR DESIGN CONDITIONS

Weather	Dry bulb temp.	Wet bulb temp.	Relative humidity %
Summer, °C	42.5	28	60
Monsoon, °C	33.9	28.7	90
Winter, °C	15.5	10.5	88

2.1.2.2 EXTREME AMBIENT CONDITIONS

Temperature : Max. 47°C. Min. 4.5°C.
RH : Max. 86%. Min. 17 %

2.1.3 DESIGN PARAMETERS

A centralized Water Polishing System (WPS) is proposed to provide the initial filling of DM water to circulating Cooling Water System (CWS) and control the water chemistry of CWS loops no. 1,2,3,4& 5 during continuous operation as long as experiments will be conducted. The outlet water quality from WPS (inlet water to CWS) shall be controllable and monitored as per table-2 given below.

The table-2 is showing the water circulation flow through each individual closed cooling loop as well as loop volume. The side stream flow (maximum 5% flow of circulating water of individual cooling loop) has been taken out from the main pump's suction header of respective loop and shall be circulated through WPS and returned back to individual Cooling loop's pressurizer in order to get mixed with the remaining circulating water.

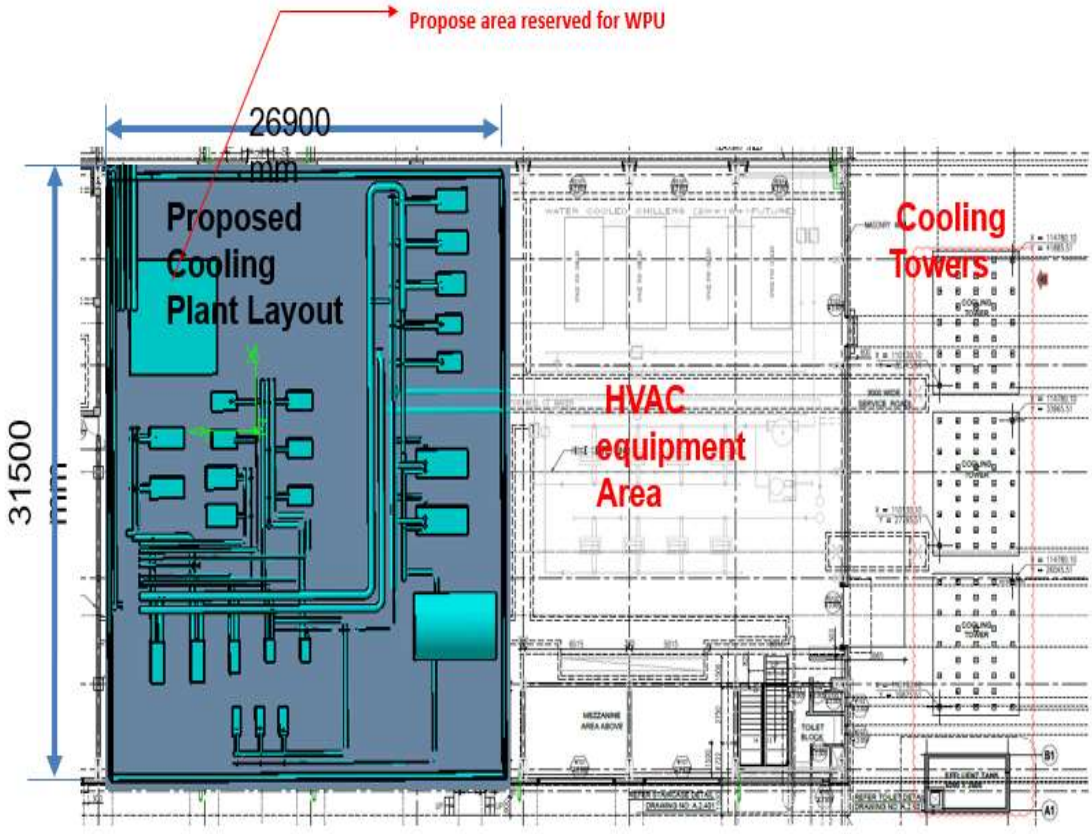
Table 2: Design Parameters

Name of Cooling Loop	Cond. (µS/cm)	DO level, (ppm)	pH	flow (m3/hr)	IN temp(°C)	Out Temp.(°C)	volume (M^3)
LOOP-1(ICECRH+PS)	≤1	≤0.1	6.5 to 7.5	317	38	58	30
LOOP-2 (DNBHP)	≤0.1	≤0.01	7 to 9	112	38	73	30
LOOP-3 (DNBLP+CDCL)	≤0.1	≤0.1	7 to 9	238	38	51	20
LOOP-4&5(IPRCH&DNBCH)	≤30	NA	6.5 to 7.5	220	25	41	15

As shown in table, a dedicated WPU for Cooling Loop-1, 2 &3 (as per section-3.1) is proposed. A separate tapping is proposed from DM water outlet for cooling Loop-4&5 (as per section -3.1) for water polishing purpose.

The contractor is required to take these as inputs data for designing overall Water Polishing System, its interconnected piping network with required instrumentation and central controlling network.
. The contractor is required to provide detailed design of the WPS and its equipment/components/items according to the latest applicable codes and standards available at the time of award of the contract.

The Water Polishing System shall be installed inside existing Water-Cooling Plant room. The required area for WPU (150 M^2 appx) inside plant room is marked as shown in the below picture.



Above sketch indicates the space for Cooling Water Plant - shaded area (31.5 m x 26.9m) appx. with clear height appx 20 ft. The space reserved for WPU is appx. 150sq M.

Water Polishing System shall polish a stream of circulating water to high quality and mix the same into the circulation water pipe line of respective cooling loops. WPS shall be designed to polish maximum 5% flow of circulating water of individual Cooling loop. The required parameters of outlet water from WPS shall be as per below table-3

The overall conceptual design is shown in process flow diagram shown in sub chapter-14. The raw water from available source inside IPR shall be treated first through WPS. The raw water from the buffer storage tank shall pass through Multi Grade Filter (MGF) and Activated Carbon Filter (ACF) by raw water feed pumps and then process through Cation and Anion units and stored in DM water storage tank. The DM water transfer pump shall take water from DM water storage tank and pass through Mixed Bed (MB) Unit-1 and same shall be stored in MB water storage buffer tank. The quality of outlet water from MB-1 shall be as per table-3.

The DM water from MB buffer storage tanks shall be used for initial charging of all 5 Cooling loops as well as their makeup water requirement during continuous operation. In order to maintain the water quality in the circulation water Cooling loop no. 1,2 &3, a side stream flow (i.e. 5% flow of respective CWS Loop flow) shall be bleed through and same shall be processed through WPS and sent back to respective CWS loops. The DM water from MB storage tank shall be initially filled in cooling Loop-4&5 and same water shall be circulated till the conductivity increases beyond acceptable limit. As

there is no monitoring on conductivity, dissolved oxygen level, it is advisable to replace whole loop's water volume with fresh DM water from MB storage tank once conductivity reaches beyond acceptable limit to be decided by the users.

The dissolved oxygen in Cooling loop-1 shall be controlled through dedicated DO unit. It is envisaged that during experiment conduct, the conductivity of circulating water may get deteriorated after few hours of operation. In that situation, the water shall be passed through MB-1 unit first and then circulated through DO unit. The circulating water of Cooling Loop No. 2 and 3 shall controlled by a dedicated WPS comprising of Cartridge Filter unit, Mixed bed unit, EDI unit and DO units working in series as shown in flow diagram. The outlet water quality shall be as per Table-3 for all Loops. The DO units shall be membrane contactor type complete with vacuum pump and other accessories as per detailed technical specifications given in the relevant data sheets. The nitrogen gas required for the WPS shall be made available in portable industrial cylinders by the Purchaser. Necessary arrangement for holding number of cylinders to make it N2 gas bank including pressure regulators, isolation valves, interconnecting gas tubing with supply of adequate size of tube manifold shall be in the scope of this tender. The gas tubing/ piping up to the injection point of individual tank/system shall be under the scope of this contract.

Necessary flow regulation with required pressure at inlet of each Cooling Loop shall be managed with set of auto-controlled valves including bypass arrangement. Online instrumentation for measurement of flow, pressure, temperature, conductivity, dissolved oxygen, pH etc parameters shall be provided. The feedback signal system with monitoring in SCADA shall be provided with WPS. The SCADA shall have facility to provide/share the parameters with Cooling Water System respective loops.

It is the responsibility of WPS contractor to provide required flow and pressure with controlled water chemistry to respective cooling loops. In order to achieve these requirements, the contractor of WPS shall include necessary control valves with motorized actuators and measuring online instrumentations with fully automation philosophy to bring minimum human intervention.

A Dosing system for pH control for all circulating cooling loops water is considered in the scope. A chlorine injection/dosing system is also included in the scope of present contract for controlling biological growth in the circulating water of Cooling tower of present Cooling water system..

The purchaser proposes contractor to consider skid mounted modular construction for DM Plant and Water Polishing unit which can minimize site fabrication/installation activities. All equipment can be mounted/fitted on the common skid and tested at factory. After successful testing at factory they can be shifted to IPR site with fully or partially knocked down condition as per the size of skid/equipment or logistics requirement.

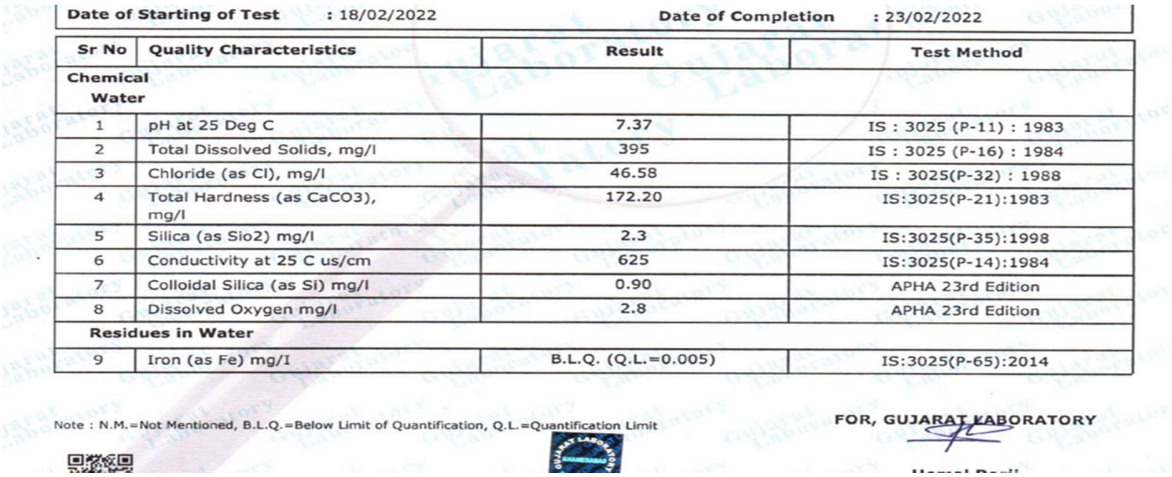
Table 3 Output Water Parameters from Water Polishing System

Cooling Loop ->	Common Loop	Cooling Loop-1 (ICECRH-PS)	Cooling Loop-2 (DNBHP)			Cooling Loop-3 (DNBLP-CDCL)		
Parameter/ Constituents	**MB-1 Oulet**	**DO* outlet**	**MB* Oulet**	**EDI Outlet**	**DO outlet**	**MB* Oulet**	**EDI Outlet**	**DO outlet**
Qty ->	**1**	**2 nos. working in parallel**	**1 no.**	**2 nos. working in parallel**	**2 nos. working in parallel**	**1 no.**	**2 nos. working in parallel**	**2 nos. working in parallel**
Flow rate thru each unit	10 M^3/Hr	8 M^3/Hr	6 M^3/Hr	3 M^3/Hr	3 M^3/Hr	12 M^3/Hr	6 M^3/Hr	6 M^3/Hr
pH	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8
Conductivity (µS/cm)	≤1	0.05-0.09	≤1	0.05-0.09	0.05-0.09	≤1	0.05-0.09	0.05-0.09
Dissolved Oxygen (ppm)	6-8.5	0.1	6-8.5	6-8.5	0.01	6-8.5	6-8.5	0.1
TDS (mg/Lit)	≤0.6	≤0.6	≤0.6	≤0.6	≤0.6	≤0.6	≤0.6	≤0.6
Silica(mg/Lit)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Net Capacity (OBR)	200 M^3	200 M^3	200 M^3	200 M^3	200 M^3	200 M^3	200 M^3	200 M^3
Note: *- to be provided with Cartridge Filter unit								

2.2 DM PLANT FOR CIRCULATING LOOP

The Design of 1 x 10 M^3/hr DM Plant is based on the raw water analysis data brief particulars as follows:

Water analysis report:



Date of Starting of Test : 18/02/2022 **Date of Completion** : 23/02/2022

Sr No	Quality Characteristics	Result	Test Method
Chemical Water			
1	pH at 25 Deg C	7.37	IS : 3025 (P-11) : 1983
2	Total Dissolved Solids, mg/l	395	IS : 3025 (P-16) : 1984
3	Chloride (as Cl), mg/l	46.58	IS : 3025(P-32) : 1988
4	Total Hardness (as CaCO3), mg/l	172.20	IS:3025(P-21):1983
5	Silica (as Sio2) mg/l	2.3	IS:3025(P-35):1998
6	Conductivity at 25 C us/cm	625	IS:3025(P-14):1984
7	Colloidal Silica (as Si) mg/l	0.90	APHA 23rd Edition
8	Dissolved Oxygen mg/l	2.8	APHA 23rd Edition
Residues in Water			
9	Iron (as Fe) mg/l	B.L.Q. (Q.L.=0.005)	IS:3025(P-65):2014

Note : N.M.=Not Mentioned, B.L.Q.=Below Limit of Quantification, Q.L.=Quantification Limit

FOR, GUJARAT LABORATORY

2.2.1 TREATMENT SCHEME FOR DM PLANT

S.NO.	DESCRIPTION
1	Raw Water Storage Tank FRP/HDPE construction (capacity 5000 Liters) with UV protection, frontal MS piping, necessary valves, level transmitter and other required set of instrumentation as per detailed technical specification- **1 Package**

2.	Raw Water Feed Pumps with Motor – 2 Nos. (1W+1S), Min 10 M^3/hr at 40 Mtrs (or suitable to OEM) head along with Suction isolation valves and motorized Discharge Valves, NRVs, strainers & interconnected piping as per detailed technical specification– **One Set**
3.	Multi Grade Filter as per detailed specifications– **One Set**
4.	Activated Carbon Filter as per detailed specifications – **One Set**
5.	Strong Acid Cation Exchanger – MSRL Construction along with frontal piping, Valves, Resin Media, Regeneration System including acid measuring system as per detailed specifications – **One Set**
6.	De Gasser System – Consist of Degasser Tower, De Gasser Water Storage Tank (Capacity- 5000 Ltrs), De Gasser Blowers – 2 Nos. (1W+1S) & De Gasser Water Feed Pumps with motor – 2 Nos. (1W+1S) along with interconnected piping with necessary valves, NRVs etc. as per detailed specifications – **One Set**
7.	Strong Base Anion Exchanger – MSRL Construction along with frontal p iping, Valves, Resin Media, Regeneration System including acid measuring system as per detailed specifications – **One Set**
8.	DM Water Storage Tanks – SS-304 construction (2 tanks, each capacity 5000 Liters) with N2 Blanketing System (without N2 cylinders) with frontal piping, necessary valves, level transmitter and other required set of instrumentation as per detailed specifications **- 1 package (total-2 tanks- DM Water Buffer Storage tank, MB Water Buffer Storage tank)**
9.	DM Water Transfer Pumps with Motor – 2 Nos. (1W+1S), Min 10 M^3/hr at 40 Mtrs (or suitable to OEM) head along with motorized Suction and Discharge Valves, NRVs, strainers & interconnected piping as per detailed technical specification– **One Set**
10.	Mixed Bed Unit – 10 M^3/hr capacity, CSRL construction along with frontal piping, necessary Valves, Mixed Bed Resin Media, Regeneration System as per detailed specifications – **One Set**
11.	DM Water Feed Pumps with Motor – 2 Nos. (1W+1S), Min 10 M^3/hr at 40 Mtrs (or suitable to OEM) head along with Suction isolation valves and motorized Discharge Valves, NRVs, strainers & interconnected piping as per detailed technical specification– **One Set**

Note: The contractor shall include the valves with actuators, interconnecting piping, necessary instrumentation and other accessories as required in the scope for above described plant.

2.3 WATER POLISHING UNIT FOR CIRCULATION COOLING LOOP

The DM water charged in the cooling loops are required to be controlled for conductivity and dissolved oxygen level during continuous operation in Loops 1, 2 and 3. Therefore, water from these loops shall be circulated through set of MB unit, EDI and membrane contactors module for maintaining the required level of conductivity and dissolved oxygen in the circulating water of respective loops. The MB is provided before EDI in order to bring the water chemistry of respective cooling loop.

1.1.1. TREATMENT SCHEME FOR WATER POLISHING UNIT

S.NO.	DESCRIPTION
1	WPU Feed Pumps with Motor- - 2 nos. (1W+1S), min 16M^3/Hr at 40Mtrs head (or suitable head) for Cooling Loop-1 - 2 nos. (1W+1S), min 6M^3/Hr at 40Mtrs head (or suitable head) for Cooling Loop-2 - 2 nos. (1W+1S), min 12M^3/Hr at 40Mtrs head (or suitable head) for Cooling Loop-3 The pumps shall be with suitable HP motor, complete with Suction isolation valve and motorized Discharge Valves, NRVs, strainers etc with interconnected battery limit SS-304 piping to each individual cooling loops as per detailed specifications – **One Set**
2.	Cartridge Filter Units as per detailed specifications for Cooling Loop nos. 1, 2 and 3 – **Three Sets**
3.	Mixed Bed Units – a) 6 M^3/hr capacity for Cooling Loop-2, b) 12 M^3/hr capacity for Cooling Loop-3 Above units shall be complete with MSRL construction along with frontal piping, necessary valves, Mixed Bed Resin Media, with in situ regeneration system etc. as per detailed technical specifications – One **Set**

4.	EDI Units – a) 6 M^3/hr capacity having 2 columns of 3M^3/hr each working in parallel for Cooling Loop-2, b) 12 M^3/hr capacity having 2 columns of 6M^3/hr each working in parallel for Cooling Loop-3 Above units shall be complete in SS-316 consist of EDI module, EDI rectifier/ Control system, EDI CIP System along with interconnected SS-304 piping, necessary valves etc as per detailed technical specifications. - **One Set.**
5.	DO units- Membrane Contactor based complete system for Dissolved Oxygen Removal of water a) 16 M^3/hr capacity having 2 columns of 8M^3/hr each working in parallel for Cooling Loop-1, b) 6 M^3/hr capacity having 2 columns of 3M^3/hr each working in parallel for Cooling Loop-2, c) 12 M^3/hr capacity having 2 columns of 6M^3/hr each working in parallel for Cooling Loop-3 Above units shall be complete in SS-316 along with interconnected SS-304 piping necessary motorized valves etc as per detailed specifications – **One Set**

TREATMENT SCHEME FOR COOLING TOWER

A Chlorine dosing system is required for controlling biological growth in circulating water through Cooling tower. The dosing system shall be with dosing tank, pumps, valves and interconnected piping etc and same shall be located near Cooling tower which is adjoining to WPS plant room.

S.NO.	DESCRIPTION
1.	Chlorine Dosing System – FRP Chlorine Solution Dosing Tank of 100 Ltrs, 2 Nos. (1W+1S) 4.0 LPH at Min 5.0 Kg/cm2 Injection Pressure Chlorine Pumps, with necessary control valves and NRVs, LDPE Tubing / CPVC Piping up to Dosing Point. -**One Set**

3 TECHNICAL SPECIFICATION FOR DM PLANT

3.1 RAW WATER STORAGE TANK – BUFFER STORAGE TANK

Table 4: Technical Specification of Raw Water Storage Tank

Buffer Storage Tank	Min 5 M^3(5000 Liters)
MOC of the Storage Tank	HDPE/FRP
Accessories	Inlet, Outlet, Drain, Overflow Nozzles, Level Gauge etc
Dimensions	2000 mm Dia. or as per OEM 2600 mm Height or as per OEM
Qty	1 No.
Accessories	Level Gauge, Level Switch -3 Point Type

3.2 RAW WATER FEED PUMPS

There shall be 2 Nos. (1W+1S) Horizontal Centrifugal Back pull out pumps for supply of raw water to DM Plant along with motorised suction and discharge valves, NRVs, interconnected MSRL Piping, pressure gauges, flow transmitter etc.as per the detailed design and process requirements.

Table 5: Technical Specification of Raw Water Feed Pumps-DM Plant

No. of Pumps with motor	2 Nos. (1w + 1s)
Type of Pump	Centrifugal Horizontal Back Pull Out
Capacity	10 M^3/Hr. each
Head	40.0 meter or suitable
MOC of Construction	Casing, Impeller, Shaft – AISI-316, Mechanical Seal – AISI-316, Base Plate – Fabricated Steel.
Suction isolation Valves, strainers	2 Nos, Size: 65mm or suitable
Discharge Control motorized Valves	2 Nos, Size: 50mm or suitable
Non-Return Valve	2 Nos, Size: 50 mm or suitable
Suction & Discharge Piping, valves	One Set, MSRL, pipes as per IS 1239 with fittings etc.

3.3 MULTI GRADE FILTER

The Pressure Sand Filter (PSF) vessel shall be vertical construction confirm to Design Standards ASME Section VIII DIV I, fabricated from CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends, of Dimensions 1200 mm Dia x 2300 mm Height or suitable for the available space. The pressure filter shall be designed for flow rate of 10 M^3/hr with operation pressure of 4-5 Kg/cm2 or to suit to overall system. The Capacity of PSF shall be normal 10 M^3/hr (continuous) excluding Back Wash Flow rate. Pressure filter vessel shall be provided with one manhole of minimum 500 mm dia and one hand hole of minimum 150 mm diameter. Provisions shall also be made to attend to the internal surface of the bottom dished end (below the bed supporting plate). It shall be complete with set of internals, Bell Mouth assembly for Inlet distribution of raw water and strainer on plate system for bottom collection.

It shall have a charge of 1000 mm bed layer of Multi Grade Sand supported by Gravel Filter. The pressure drop across filter bed should be not more than 4 mwc. The supporting bed made of gravel shall be rounded material free from clay and limestone. A minimum 50% free board shall be available above filter bed. The distribution and collection system of wastewater shall be MS with corrosion resistant painting. Two Nos. of Air Blowers are Supplied for supply of Air during Air Scoring in Backwash Sequence.

Table 6: Technical Specification of Multi Grade Filter-DM Plant

MULTI GRADE FILTER	
No. of Streams	One No. min.
Model	As per OEM
Design Code	ASME Section VIII DIV I
Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends
Max Operating Pressure	4-5 Kg/cm2 or acceptable to overall system
Diameter of Vessel in mm	1200 or as per OEM
H.O.S.in mm	2300 or as per OEM
Shell & dish end Thickness	Shell & Dish end thickness 6 /8 mm
Internal Protection	Duly Sand blasted to SA 21/2 & One Coat of Primer & 2 Coats of Asphaltene Black
External Protection	Duly Sand blasted to SA 21/2, Corrosion Resistant Primer & Two Coats of Epoxy Painted
Flow Rate	Normal – 10 M^3/hr
Treated Water Suspended Solids in PPM	< 5

Pressure Drop at the end of Service Cycle in kg/cm2	≤1.0
Filter Media	One Charge of Multi Grade Sand as described above
Under Bed material	One Charge as described above
Valve Schedule	Inlet, Outlet, Backwash inlet, Backwash Outlet, Drain, Air Release & Air Inlet
Frontal Piping & Valves	MS as per IS 2825, CI Diaphragm Valves
No. of Air Scoring Blowers	2 Nos. (1W+1S)
Accessories	V-belt, Drive & Driven Pulleys, Suitable Driver, Belt Guard, Inlet Silencer and Air Filter, Discharge NRV and Control Valve
Instruments	50 mm size vortex type flow transmitter at the Outlet of Inlet and Outlet Pressure Gauges with Isolation Valves, Pressure Gauges shall be 4" Dial, Bottom Entry Type of Range – 0-10 kg/cm2.
Accessories	Foundation Bolts, All Matching Flanges, Nut & Bolts, Approach Ladder, Operating Platform

3.4 ACTIVATED CARBON FILTER

The Activated Carbon Filter (ACF) vessel shall be vertical construction confirm to Design Standards ASME, Section VIII DIV I fabricated from CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends, of Dimensions 1200 mm Dia x 2500mm H.O.S. or as per OEM to suit the site space available. Max design flow rate of 20 M^3/hr. and design pressure shall be 5.0 Kg/cm2 or acceptable to overall system. The capacity of ACF shall be normal 10 M^3/hr (Continuous) excluding back wash flow rate.

Filter vessel shall be provided with one manhole of minimum 500 mm dia and one hand hole of minimum 150 mm diameter. Provisions shall also be made to attend to the internal surface of the bottom dished end (below the bed supporting plate). It shall be complete with set of Internals, Inverted Funnels assembly for inlet distribution of raw water and strainer on plate system for bottom collection. Suitable strainer shall be provided at the outlet of ACF to avoid carryover of carbon particles.

The supporting bed made of gravel shall be rounded material free from clay and limestone. A minimum 75 % free board shall be available above Filter bed.

Table 7 : Technical Specification of Activated Carbon Filter- DM Plant

ACTIVATED CARBON FILTER	
No. of Streams	One No. min.
Model	As per OEM
Design Code	ASME Section VIII DIV I
Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends
Max Operating Pressure	4-5 Kg/cm2 or acceptable to overall system
Diameter of Vessel in mm	1200 or as per OEM
H.O.S. in mm	2500 or as per OEM
Shell & dish end Thickness	As per design Shell & Dish end thickness shall be 6 /8 mm
Internal Protection	Duly Sand blasted to SA 21/2 & One Coat of Primer & 2 Coats of Asphaltene Black
External Protection	Duly Sand blasted to SA 21/2, Corrosion Resistant Primer & Two Coats of Synthetic Enamel
Flow Rate	Normal – 10 M^3/hr
Pressure Drop at the end of Service Cycle in kg/cm2	≤1.0
Filter Media	One Charge of Activated Carbon with min Iodine Value
Valve Schedule	Inlet, Outlet, Backwash inlet, Backwash Outlet, Drain, Air release.
Frontal Piping & Valves	MS as per IS 2825, CI Diaphragm Valves
Backwashing Procedure	Backwash is Carried out once DP more than 1.0 Kg/cm2 or 20 hours of Operation whichever is Earlier
Instruments	Inlet and Outlet Pressure Gauges with Isolation Valves, Pressure Gauges shall be 4" Dial, Bottom Entry Type of Range – 0-10 kg/cm2.

Accessories	Foundation Bolts, All Matching Flanges, Nut & Bolts, Approach Ladder, Operating Platform

3.5 STRONG ACID CATION EXCHANGER

The Strong Acid Cation Exchanger vessel shall be vertical Construction confirm to Design Standards ASME, Section VIII DIV I, fabricated from CS as per IS: 2002 (Gr-2 /SA 515-516 GR 70), for Shell and Dish ends. SAC Dimensions shall be 1200 mm Dia x 2200 mm H.O.S. or as per OEM to suit available space at site. Design Pressure of the column shall be as per OEM requirement or acceptable to overall system. The Operating flow rate of SAC Shall be Normal – 10 M^3/hr. It will produce net output of 200 M^3 of de-cat ionized water between two successive regeneration.

SAC shall be provided with one manhole of minimum 500 mm dia and one hand hole of minimum 150 mm diameter. Provisions shall also be made to attend to the internal surface of the bottom dished end (below the bed supporting plate). It shall be complete with set of Internals, suitably O\oriented inverted funnels assembly for inlet distribution of water, strainer on plate system for bottom collection for uniform back was distribution, sight glass and header with laterals for middle collector. It shall have one charge of resin having bed depth ~1300 mm or as per OEM recommendation.

Internally surface is protected by 4-5mm thick rubber lining on duly sand blasted surface to SA 21/2, externally protected by two coats of corrosion resistant primer & two coats of protective finish paint.

Table 8 : Technical Specification of Strong Acid Cation Exchanger- DM Plant

STRONG ACID CATION EXCHANGER	
No. of Streams	One No. min.
Design Code	ASME Section VIII DIV I
Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends
Material of Construction	CSRL
Diameter of Vessel	1200 mm or as per OEM
H.O.S.	2200 mm or as per OEM
Maximum Working Pressure	4-5 kg/cm2 or acceptable to overall system
Hydro Test Pressure	1.5 times of design pressure

Shell & dish end Thickness	As per design, Shell / Dish end thickness shall be 6 /8 mm (minimum)
Normal Flow Rate	10 M^3/hour
Internal Protection	Duly sand blasted with 4-5mm thick Natural Rubber Lined
External Protection	One Coat of Corrosion resistant primer and two coats of Epoxy Paint
Output per regeneration / Per Stream	200 M^3
Frontal Piping & Valves	MSRL as per IS 2825 & CIEL Diaphragm Valves
Valve Schedule	Inlet, Outlet, Back Wash Inlet, Back Wash Outlet, Air Release, Drain, Middle Collector Flush, Middle Collector Outlet etc.
Instruments for Each Stream	Inlet and Outlet Pressure Gauges with Isolation Valves, Pressure Gauges shall be 4" Dial, Bottom Entry Diaphragm Seal Type of Range – 0-10 kg/cm2 Flow through Chamber & Sampling Valves. Tubing (if required)
Accessories	2 Nos., Resin Traps at the Service Outlet & Back Wash Outlet, 2 Nos. Internal View Glass.

3.5.1 ACID MEASURING TANK FOR SAC WITH FUME ARRESTOR

Table 9: Technical Specification of Acid measuring Tank for SAE

No. of Measuring Tanks	One No.
Min capacity	350 Ltrs. Suitable for One regeneration of SAC

Type of tank	Vertical Cylindrical
Diameter of Vessel	700 mm or as per OEM
Height	900 mm or as per OEM
MOC of the Acid Measuring Tank	CSRL
Accessories	Inlet Nozzle, Outlet Nozzle, Drain Nozzle, Safe Vent, Nozzles for Level Gauges
Acid Injection system	Consist of Ejector & Accessory valves such as Power Water, Acid Suction & Ejector Outlet etc.
Fume absorber	Vertical Cylindrical, FRP with Inlet, Outlet, Service Water Inlet, Drain & Overflow nozzles etc.

3.5.2 DEGASSIFIER SYSTEM

It consists of. Degasser Tower, Degasified Water Storage Tank, 2 Nos. DG Air Blowers & 2 Nos. Degasified Water Transfer Pumps. The distance between Degasser tower and DG feed pumps shall not be more than 20 meters.

3.5.2.1 Degasser Tower with Air Blowers

De-carbonating tower shall be designed for counter current flow of treated water and air. An adequate effective internal cross-sectional area shall be provided to handle the required maximum flow at minimum velocity to ensure removal of carbon dioxide to the lowest acceptable limit. The De-carbonating towers shall be rubber lined with minimum thickness 4-5 mm.

3.5.2.2 Degasified water Storage Tank

It is Horizontal CSRL construction, suitable to store water for 1 regeneration of SAC & 10 Min residence & 20% free board. It shall be provided with necessary nozzles, manholes etc. The DG storage tank shall have tubular type Level Gauge & Low-Level switch for protection of DG Water Transfer pumps from dry run. It is internally protected by 4-5 mm thick rubber lining on duly sand blasted surface, externally protected with finish paint.

Table 10: Technical Specification of Degasified Water Storage Tank and pumps

Working Pressure	Atmospheric
Diameter of Degasser Tower in mm	600 or as per OEM
Normal Flow Rate	10 M^3/hr
M.O.C.	SS 304

Internal Protection	Duly sand blasted with 4-5mm thick Natural Rubber (rubber Lined).
External Protection	One coat of corrosion resistant primer and two coats of epoxy painted
Accessories	Inlet, Outlet, Air Inlet & Extended Air Vent Duct.
DEGASSER AIR BLOWERS	
Blower Capacity	as per OEM @ 100mm WG
No. of Blowers with motor	Two (1W+1S)
Mounting	Outdoor
Type of Blower	Centrifugal
Accessories	Discharge Dampeners, Suction Filter.
DM WATER STORAGE TANK	Qty – 1 No.
Degasified Water Storage Tank Capacity	5 M^3 or as per design acceptable to overall system
MOC of the DG Storage Tank	SS-304
Type of DG Tower	Horizontal Cylindrical with Dished Ends
Dia of the DG Storage tank	as per OEM
L.O.S. of Storage Tank	as per OEM
Accessories	Inlet, Outlet, Overflow, Drain, LG.
DEGASSED WATER TRANSFER PUMPS	
Capacity	10 M^3/hr @ 35-meter head
No. of Pumps with motor	Two Nos. (1w+1s)
Type of Pump	Horizontal Centrifugal Back Pullout type.
MOC of Construction	Casing, Impeller, Shaft – AISI-316, Mechanical Seal – AISI-316, Base Plate – Fabricated Steel.
Suction Isolation Valves	2 Nos, of suitable size
Discharge Isolation motorized Valve &	2 Nos. of suitable size
Non-Return Valve	2 Nos of suitable size
Suction & Discharge Piping, valves	SS 304

Instruments	Pressure Gauges with Isolation Valves at the Discharge of Each Pump, Pressure Gauges shall be 4” Dial, Bottom Entry Diaphragm Seal Type of Range – 0-10 kg/cm2

3.6 STRONG BASE ANION EXCHANGER

The Strong Base Anion (SBA) exchanger vessel shall be vertical construction confirming to Design Standards ASME, Section VIII DIV I, fabricated from IS: 2002 (grade-2 / SA 515-516 GR 70) material for Shell and Dish ends. SBA dimensions shall be 1100 mm Dia x 2000mm H.O.S. or as per OEM to suit to available space at site. Operating pressure of the column shall be as per OEM or acceptable to overall system. The operating flow rate of SBA shall be normal- 10 M^3/hr and it will produce net output of 200 M^3 of SBA Quality Water between two successive regeneration.

SBA shall be provided with one top manhole of minimum 500 mm dia and one hand hole of minimum 150 mm diameter. Provisions shall also be made to attend to the internal surface of the bottom dished end (below the bed supporting plate). It shall be complete with set of Internals, suitably oriented inverted funnels assembly for Inlet distribution of Degasified water, strainer on plate system for bottom collection for uniform back wash distribution, Sight Glass and header with laterals for middle collector. It shall have one charge of resin having bed depth of min.1000 mm.

Internal surface is protected by 4-5mm thick rubber lining on duly sand blasted surface, externally protected by two coats of corrosion resistant primer & two coats of protective paint.

Table 11: Technical Specification of Strong Base Anion Exchanger

STRONG BASE ANION EXCHANGER	
No. of Streams	One No. min.
Design Code	ASME Section VIII DIV I
Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends
Material of Construction	CSRL
Diameter of Vessel	1100 mm or as per OEM
H.O.S.	2000 mm or as per OEM
Maximum Working Pressure	4-5 kg/cm2
Hydro Test Pressure	1.5 times of design pressure
Shell & dish end Thickness	As per design Shell / Dish end thickness shall be 6 /8 mm min.
Normal Flow Rate	10 M^3/hour
Internal Protection	Duly sand blasted with 4-5mm thick Natural Rubber (rubber Lined)

External Protection	One coat of corrosion resistant primer and two coats of Epoxy painted
Net Output per regeneration / Per Stream	200 M^3
Frontal Piping & Valves	MSRL as per IS 2825 & CIEL Diaphragm Valves
Valve Schedule	Inlet, Outlet, Back Wash Inlet, Back Wash Outlet, Air Release, Drain, Middle Collector Inlet, Middle Collector Outlet & Drain
Instruments for Each Stream	Inlet and Outlet Pressure Gauges with Isolation Valves, Pressure Gauges shall be 4" Dial, Bottom Entry Diaphragm Seal Type of Range – 0-10 kg/cm2 Flow through Chamber & Sampling Valves, Tubing (if required) One No. Online Conductivity Analyzer – Conductivity Sensor, Conductivity Analyzer, Flow Through Chamber & Sampling Valves & Tubing
Accessories	2 Nos., Resin Traps at the Service Outlet & Back Wash Outlet, 2 Nos. Internal View Glass.

3.7 CAUSTIC MEASURING TANK FOR SBA

Table 12: Technical Specification of Caustic measuring Tank for SBA

No. of Measuring Tanks	One No.
Min capacity	250 Ltrs
Type of tank	Vertical Cylindrical
Diameter of Vessel	650 mm or as per OEM
Height	900 mm or as per OEM
MOC of the Caustic Measuring Tank	CSRL
Internal Protection	One coat of corrosion resistant primer and two Coats of black bituminous paint or equivalent standard good engineering practices
External Protection	One coat of corrosion resistant primer and two coats of Epoxy painted
Accessories	Inlet Nozzle, Out let Nozzle, Drain Nozzle, Safe Vent, Nozzles for Level Gauges & Agitator of suitable rating
Caustic injection system	Consist of Ejector & Associated Valves such as Power Water, Caustic Suction & Ejector Outlet etc.

3.8 MIXED BED POLISHING UNIT

The Mixed Bed (MB) polishing unit shall be vertical in construction confirming to Design Standards ASME, Section VIII DIV I, (SA 515-516 GR 70). Material for Shell and Dish ends. The dimensions as per OEM to suit to available space at site. MB Design Pressure Shall be 5.0 Kg/cm2 min. The Capacity of MB shall be Normal- $10M^3$/hr (Continuous). It will produce 200 M^3 of treated water between two successive regeneration.

MB shall have One No. hand hole (suitable size) on shell. Provisions shall also be made to attend to the internal surface of the bottom dished end (below the bed supporting plate). It shall be complete with set of Internals, suitably oriented header with top distributor, strainer on plate system for bottom collection & uniform back wash distribution.

It shall have mix of Cation & Anion Exchange resins. Internal surface shall be protected by 4-5mm thick rubber lining on duly sand blasted surface, externally protected by two coats of

corrosion resistant primer & two coats of finish painting. Mixed Bed Exchanger will be provided with the Air Scouring Facility. The pH correction chemical dosing system shall be part of MB unit which is required to control the pH of water being stored in DM storage tank

Table 13: Technical Specification of Mixed Bed Polishing Unit

Mixed Bed Unit	
No of Streams	One no.
Design Code	ASME Section VIII DIV I
MOC of the MB	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends
Material of Construction	CSRL
No of Streams	One
Diameter of Vessel in mm	as per OEM
H.O.S. in mm	as per OEM
Maximum Working Pressure	4-5 kg/cm2 or acceptable to system
Normal Flow Rate	10 M^3/hour
Shell & dish end Thickness	As per design Shell & Dish end thickness shall be 6 /8 mm,
Internal Protection	Duly sand Blasted with 4.5mm Thick Natural Rubber Lined
External Protection	One Coat of Corrosion resistant primer and two coats of Epoxy paint
Service Cycle	200 hours
Output per regeneration	200 M^3
View Glasses	2 Sets with necessary mounting arrangement
Piping & Valves	Frontal piping-MSRL, interconnecting piping-SS-304
Valve Schedule	Inlet, Outlet, Back Wash Inlet, Back Wash Outlet, Air Release, Drain, Middle Collector Flush, Middle Collector Outlet, Air inlet

Instruments for Each Stream	Inlet and Outlet Pressure Gauges with Isolation Valves, Pressure Gauges shall be 4" Dial, Bottom Entry Diaphragm Seal Type of Range – 0-10 kg/cm2 One no. online PH analyzer with PH sensor Flow Through Chamber & Sampling Valves & Tubing. One No. Online Conductivity Analyzer – Conductivity Sensor,
Accessories	2 Nos., Resin Traps at the Service Outlet & Back Wash Outlet, 2 Nos. Internal View Glass.

3.9 ACID MEASURING TANK FOR MIXED BED POLISHING

Table 14: Technical Specification of Acid measuring Tank for MB Polishing Unit

No. of Measuring Tanks	One No.
Min capacity	250 Ltrs.
Type of tank	Vertical Cylindrical
Diameter of Vessel	600 mm or as per OEM
Height	900 mm or as per OEM
MOC	CSRL
Accessories	Inlet Nozzle, Out let Nozzle, Drain Nozzle, Safe Vent, Nozzles for Level Gauges, Water Dilution Nozzle. Acid Handling system of sufficient capacity shall be provided based on requirement.
Acid Injection system	Consist of Ejector & Accessory Valves Such as Power Water, Acid Suction & Ejector Outlet.
Fume absorber	Vertical Cylindrical, FRP with Inlet, Outlet, Service Water Inlet, Drain & Overflow nozzles etc.

3.10 CAUSTIC MEASURING TANK FOR MB

Table 15: Technical Specification of Caustic measuring Tank for MB Polishing Unit

No. of Measuring Tanks	One No.
Min capacity	300Ltrs.
Type of tank	Vertical Cylindrical
Diameter of Vessel	600 mm or as per OEM
Height	900 mm or as per OEM
MOC	CSRL
Internal Protection	One Coat of Corrosion resistant primer and two coats of black bituminous paint.
External Protection	One coat of corrosion resistant primer and two coats of Epoxy Paint
Accessories	Inlet Nozzle, Outlet Nozzle, Drain Nozzle, Safe Vent, Nozzles for Level Gauges & Agitator. Alkali Handling system of sufficient capacity shall be provided based on requirement.
Caustic injection system	Consist of Ejector & Associated valves such as Power Water either from SBA discharge header or regeneration feed Pump, Caustic Suction & Ejector outlet.

3.10.1 M.B. BLOWER

Table 16: Technical Specification of Mixed Bed Blower

Description	
Capacity	as per OEM and suitable for system
Pressure	as per OEM and suitable for system
Quantity	Two Nos. (1W+1S) with motor

3.11 DM WATER STORAGE TANK – BUFFER STORAGE TANK

Table 17: Technical Specification of DM Water and MB Water Storage tank

Buffer Storage Tanks	Min 5 M^3 (5000 Liters)
MOC of the Storage Tanks, piping & valves	-SS-304
Accessories	Inlet, Outlet, Drain, Overflow Nozzles, Level Gauge, Overflow Seal pots etc.
Dimensions	as per OEM
Qty	2 Nos.
Accessories	Level Gauge, Level transmitter and feedback system including pressure relief, vacuum relief and safety valves
N2 Blanketing System	It shall be provided with N2 Blanketing system to avoid ingress of Atmosphere into the Storage Tank. N2 gas cylinder shall be provided by the Purchaser. The system consists of manifold for cylinder connection, Pressure Regulators, PCV, Flow Control Globe Valve, Isolation Valves, interconnecting tubing to the respective point of injection in the tank shall be in the scope of this contract. – 2 Sets

3.12 DM WATER TRANSFER PUMPS

There shall 2 Nos. (1W+1S) DM Water transfer Pumps to be provided for quick fill and make up water feed to the individual cooling Loops.

Table 18: Technical Specification of DM water Transfer Pumps

No. of Pumps with motor	2 Nos. (1W + 1S)
Type of Pump	Centrifugal Horizontal Back Pull Out
MOC	Casing, Impeller, Shaft – AISI-316, Mechanical Seal – AISI-316, Base Plate – Fabricated Steel.
Capacity	10 M^3/Hr. each or as per OEM
Head	30.0 meter or suitable
Suction isolation Valve	2 Nos,
Discharge Control motorized Valves	2 Nos
Non-Return Valve	2 Nos.
Suction & Discharge Piping, valves	SS-304

3.13 DM WATER FEED PUMPS

There shall be 2 Nos. (1W+1S) DM Water feed Pumps to be provided for quick fill and make up water feed to the individual cooling Loops.

Table 19: Technical Specification of DM Water Feed Pumps

No. of Pumps with motor	2 Nos. (1W + 1S)
Type of Pump	Centrifugal Horizontal Back Pull Out
MOC	Casing, Impeller, Shaft – AISI-316, Mechanical Seal – AISI-316, Base Plate – Fabricated Steel.
Capacity	10 M^3/Hr. each or as per OEM
Head	30.0 meter or suitable
Suction isolation Valve	2 Nos,
Discharge Control motorized Valves	2 Nos
Non-Return Valve	2 Nos.
Suction & Discharge Piping, valves	SS-304

4 WATER PURIFICATION UNIT

4.1 WPU FEED PUMPS

There shall be 6 Nos. Horizontal Centrifugal Back pull out pumps. 2 pumps (1W+1S) for each cooling Loop1,2&3 for supply of water to WPU along with motorised suction & discharge valves, interconnected Suction & Discharge piping and measuring instruments etc. All pumps shall be equipped with Variable Frequency Drive (VFD) which will facilitate for regulation of water flow through pump during the event of closer of one stream of EDI and DO unit in the respective loop

Table 20: Technical Specification of WPU Feed Pumps

No. of Pumps with motor and VFD	-2 Nos. (1W+1S), Min 8 M^3/hr at 40 Mtrs Head (or suitable head) for Loop-1 -2 Nos. (1W+1S), Min 6 M^3/hr at 40 Mtrs Head (or suitable head) for Loop-2 -2 Nos. (1W+1S), Min 12 M^3/hr at 40 Mtrs Head (or suitable head) for Loop-3
Type of Pump	Centrifugal Horizontal Back Pull Out
MOC	Casing, Impeller, Shaft – AISI-316, Mechanical Seal – AISI-316, Base Plate – Fabricated Steel.
Suction isolation Valve	6 Nos, Size: 50-100 mm suitable to loop
Discharge Control motorized Valves	6 Nos, Size: 25-100 mm suitable to loop
Non-Return Valve	6 Nos, Size: 25-100mm as per Pump requirement
Suction & Discharge Piping, Valves	Complete SS 304
Suction Headers	3 Sets, Connecting to Pressurizer Tanks of each Loop with motorized Globe valves and feedback automation scheme compatible with SCADA

Discharge Header & Interconnecting Piping	Discharge header (from pumps) shall be Connected to WPU Unit, The Outlet WPU shall be Connected to Pressurizer Tanks of 3 individual Circulating Loops with motorized Globe Valves & each Loop shall be provided with Vortex Type Flow Meter to control the Make up to individual cooling loop. The automation shall be compatible with SCADA

4.2 CARTRIDGE FILTER UNITS

There shall be 1 no. fine cartridge filtration unit for entrapping suspended solids generated in each cooling Loop-1,2 & 3. Each Filter unit shall be connected to common inlet & outlet headers with individual auto-controlled isolation valves. The cartridge filter unit complete in SS 316 construction with pleated 5 micron rated absolute cartridges. Cartridge filter shall be provided with air relief valve, pressure relief valve, inlet & outlet nozzles, drain nozzle with isolation valve.

Table 21: Technical Specification of Cartridge Filter Unit

CARTRIDGE FILTER UNITS	
No. of Streams	One Stream (min.) with following capacity i) $8M^3$/hr flow rate for Cooling Loop-1 ii) $6M^3$/hr flow rate for Cooling Loop-2 iii)$12M^3$/hr flow rate for Cooling Loop-3
Max Operating Pressure	4-5 Kg/cm^2 or acceptable to overall system
MOC of Cartridge Filtration Unit	Complete in SS 316
No of Cartridges	as per OEM to suit overall system
Inlet & Outlet Piping, valves	Complete with SS 304
Accessories	Air Relief Valve, Pressure Safety Valve DP Gauge with motorized Isolation Valves

4.3 MIXED BED POLISHING (WPU) UNIT

The Mixed Bed (MB) shall be vertical in construction confirming to Design Standards ASME, Section VIII DIV I, (SA 515-516 GR 70 material for Shell and Dish ends) . The dimensions shall be as per OEM to suit to available space at site. The capacity of MB shall be $6M^3$/hour (Cooling Loop-2) and $12M^3$/hour (Cooling Loop-3) It will produce 200 M^3 of treated water between two successive regeneration per stream.

MB shall have One No. hand hole (suitable size) on shell. Provisions shall also be made to attend to the internal surface of the bottom dished end (below the bed supporting plate). It shall be complete with set of Internals, suitably oriented header with top distributor, strainer on plate system for bottom collection & uniform back wash distribution.

It shall have Mix of Cation & Anion Exchange resins. Internal surface shall be protected by 4-5mm thick rubber lining on duly sand blasted surface, externally protected by two coats of corrosion resistant primer & two coats of finish painting.

Table 22: Technical Specification of Mixed Bed- WPU Unit

MB Units Description	
No of Streams	One No. (Cooling Loop 2) One No. (Cooling Loop 3)
Design Code	ASME Section VIII DIV I
MOC of the MB	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends
Material of Construction	CSRL
Diameter of Vessel in mm	as per OEM
H.O.S. in mm	as per OEM
Maximum Working Pressure	4-5 kg/cm2 or acceptable to overall system
Normal Flow Rate	$6M^3$/hour (Cooling Loop-2) $12M^3$/hour (Cooling Loop-3)
Shell & dish end Thickness	As per design Shell & Dish end thickness shall be 6 /8 mm,
View Glasses	2 Sets with necessary Mounting arrangement on each MB unit
Piping & Valves	Frontal- MSRL, interconnecting piping-SS 304& SS Diaphragm Valves
Valve Schedule	Each MB unit shall be complete with Inlet, Outlet, Back Wash Inlet, Back Wash Outlet, Air Release, Drain, Middle Collector Flush, Middle Collector Outlet, Air inlet

Instruments for each MB Unit	Inlet and Outlet Pressure Gauges with Isolation Valves, Pressure Gauges shall be 4" Dial, Bottom Entry Diaphragm Seal Type of Range – 0-10 kg/cm2 One No. Online PH Analyzer – PH Sensor, PH Analyzer, Flow Through Chamber & Sampling Valves & Tubing. One No. Online Conductivity Analyzer – Conductivity Sensor, Conductivity Analyzer, Flow Through Chamber & Sampling Valves & Tubing Vortex Type Flow Meter – 1 No.
Accessories	2 Nos., Resin Traps at the Service Outlet & Back Wash Outlet, 2 Nos. Internal View Glass.

4.3.1 ACID MEASURING TANK FOR MIXED BED POLISHING

Table 23: Technical Specification of Acid measuring Tank-MB(WPU)

No. of Measuring Tanks	One No.
Min capacity	350.0 Ltrs.
Type of tank	Vertical Cylindrical
Diameter of Vessel	700 mm or as per OEM
Height	950 mm or as per OEM
MOC	CSRL
Accessories	Inlet Nozzle, Out let Nozzle, Drain Nozzle, Safe Vent, Nozzles for Level Gauges, Water Dilution Nozzle.
Acid Injection system	Consist of Ejector & Accessory Valves Such as Power Water, Acid Suction & Ejector Outlet.
Fume absorber	Vertical Cylindrical, FRP with Inlet, Outlet, Service Water Inlet, Drain & Overflow nozzles etc.
Regeneration Piping	UPVC/FRP

4.3.2 CAUSTIC MEASURING TANK FOR MB

Table 24: Technical Specification of Caustic measuring Tank- MB (WPU)

No. of Measuring Tanks	One No.
Min capacity	500Ltrs.
Type of tank	Vertical Cylindrical
Diameter of Vessel	820 mm or as per OEM
Height	950 mm or as per OEM
MOC	CSRL
Internal Protection	One coat of corrosion resistant primer and two coats of black bituminous paint.
External Protection	One coat of corrosion resistant primer and two coats of epoxy paint
Accessories	Inlet Nozzle, Outlet Nozzle, Drain Nozzle, Safe Vent, Nozzles for Level Gauges & Agitator

Caustic Injection system	Consist of Ejector & Associated Valves Such as Power Water either from SBA discharge Header or Regeneration feed Pump, Caustic Suction & Ejector Outlet.

4.3.3 M.B. BLOWER

Table 25: Technical Specification of Mixed Bed Blower (WPU)

Description		**Cooling loop-2**	**Cooling loop-3**
1	Capacity	as per OEM	as per OEM
2	Pressure	as per OEM	as per OEM
3	Quantity	One No. with motor	One No. with motor
4	MOC	CI	CI

4.4 ELECTRO DEIONIZATION SYSTEM

The proposed Electro De-Ionization (EDI) System shall be with complete accessories, power control (DC rectifier) unit, highly sensitive instruments, touch panel display control panel etc. to achieve required output quality parameters for Cooling Loops- 2& 3 and its make up requirement.

4.4.1 COMPLETE EDI SYSTEM – SKID MOUNTED

Table 26: Technical Specification of EDI System

Description	Specification
EDI Module	High Flow, High Recovery Module. Material of construction for Major Components: Wetted components of the module consist of: PVC (adapters), nylon/ABS, polypropylene, silicone, ion-selective membranes, ion exchange resins, and thermoplastic elastomer. Housing is FRP, with a glossy finish.
Quantity	i) One EDI set for Cooling Loop-2 with 2 parallel streams of $3M^3$/hr flow rate ii) One EDI set for Cooling Loop-3 with 2 parallel streams of $6M^3$/hr flow rate
DC Rectifier & Control System	Direct connection from line power, no isolation transformer required, higher efficiency, 3-phase switch mode power supply, 380-480 V AC-50Hz input range
Piping & Valves	Complete in SS 304 or superior
EDI Skid	Complete in SS 304 or superior with all support accessories
Flow Transmitters	Vortex Type, Feed Inlet, Permeate, reject/ Concentrate
Pressure Gauge & Transmitters	Pressure Gauges – Panel Mounted, Feed, Product & Concentrate Pressure Transmitters: On Product &feed
Cartridge Filter Unit	SS 316 L Housing & 1 Micron Rated Filter Cartridges with each Loop
Conductivity Transmitter	1 No. -at the Feed Inlet 1 No. at Reject/ concentrate Above shall be for each individual Cooling loop
Cleaning system with Cleaning Pump	Portable type with each loop
PLC, HMI & Control Panel	To control the DC Power Supply to EDI Unit, to monitor the Output Parameters, To Operate the complete System & sequence in Auto

5 MEMBRANE CONTACTOR BASED DO REMOVAL SYSTEM

The Design of the System is based on latest technology with Membrane Contactor with Inert gas purging & Vacuum Degasification methodology. The contractor has to consider following points for design of the System.

The source of water is from EDI treatment, having conductivity of ≤ 0.1 µs/cm. This water shall be fed to membrane contactor for removal of inlet Dissolved Oxygen and bring same at outlet ≤ 0.01 ppm in Loop-2 and ≤ 0.1 ppm in Loop-1&3.

5.1 DESIGN BASIS

(i) Source of water: EDI processed water
(ii) Conductivity: as per EDI output
(iii) Temperature range: 25 – 40 °C
(iv) Inlet dissolved oxygen: as per EDI design criteria
(v) Outlet dissolved oxygen: ≤0.01 ppm in Loop-2 and ≤ 0.1 ppm in Loop-1&3 at 25 Deg. C
(vi) Design Flow Rate through each parallel stream: $8M^3$/Hr in Loop-1, $3M^3$/Hr in Loop-2 and $6M^3$/Hr in Loop-3

5.2 PROCESS DESCRIPTION:

The treated water from EDI unit enters the membrane contactor through the inlet distribution channel. The membrane contactor consists of membrane fibres of polypropylene encased in SS316 housing. Water containing dissolved oxygen gas flows outside the hollow fibres encased in the housing. Nitrogen gas of ≥ 99 % purity is injected inside the fibers through the inlet port of the housing. At the outlet port where the nitrogen gas comes out, Vacuum pump is operated. Vacuum and Nitrogen sweep gas reduces the partial pressure of dissolved oxygen in the feed inlet, thereby defusing into hollow fine fibers membrane. This mode of operation is called combo mode (vacuum + Nitrogen sweep). The water leaving the membrane contactor will be degassed and the oxygen content will be ≤ 0.01 ppm as desired. The nitrogen shall be distributed through manifold and controlled valve arrangement. The nitrogen cylinders shall be provided by the Purchaser but the whole arrangement including skid for mounting cylinders of required quantity, SS manifold and interconnected SS piping/ tubing with necessary control valves and other accessories as required for successful operation of the plant shall be responsibility of the contractor under this scope of work. The service water required for vacuum pump shall be provided by the Purchaser at mutually agreed interface point inside plant room.

5.2.1 TECHNICAL DATA

Type of membrane & configuration	:	Microporous, Hydrophobic, Hollow Fibre
material of construction	:	Polypropylene or OEM recommendation
MOC Housing	:	SS316

5.2.2 TECHNICAL DETAILS FOR SKID MOUNTED DISSOLVE OXYGEN REMOVAL SYSTEM

Table 27: Technical Specification of Skid Mounted Dissolved Oxygen removal System

Specifications	
Number of streams	a) 2 streams of 8 M^3/hr for Loop-1 b) 2 streams of 3 M^3/hr for Loop-2 c) 2 streams of 6 M^3/hr for Loop-3
Housing Type	SS316
Membrane Type & Configuration	Microporous, Hydrophobic, Hollow fibers
Design Temperature, Deg C	25-40
Dissolved Oxygen at Contactor's Inlet	8.5-6.5 ppm or as per EDI output
Dissolved Oxygen at Contactor's Outlet	≤ 0.01 PPM for Loop-2 ≤ 0.1 PPM for Loop-1&3
Operating Mode	Vacuum + Nitrogen Sweep
Minimum N2 gas purity	≥ 99%
MOC of Membrane Skid	SS 316
Complete Piping & Valves in the System	SS 304
Instruments	DO Analyzer on Product Line Pressure Transmitter – 3 Nos, N2 Gas Flow meter – 3 Nos. Vacuum Gauge & Transmitter – 3 Nos., pressure & Temperature gauges-3 sets,
N2 Flow Control System	The system consists of manifold for cylinder connection, Pressure Regulators, PCV, Flow Control Globe Valve, Isolation Valve & Piping for supply of Sweep Gas at required pressure – 3 Sets
Vacuum System	It Consist of 2 Nos. (1W+1S) Vacuum Pumps (with motor) of suitable flow at specified vacuum, with Service Water Vacuum Ring. Complete Piping & isolation/control motorized valves/ Non-return Valves- 3 sets

5.2.3 WASTE WATER DISPOSAL SUBMERCIBLE PUMP:

There shall be 1 No. submersible Waste water transfer pump with SS316 MOC, 30 M head and 5 M^3/hr capacity to be provided. The pump shall be with auto discharge valve, NRV and PVC piping of suitable size to be connected to the nearest industrial drainage. The pump shall be located in the waste water disposal tank/underground sump. The sump is outside plant room near cooling tower area of CWS.

6 CHLORINE DOSING SYSTEM

The circulating water of cooling tower shall have biological growth which is harmful Heat exchangers and other equipment of the HRS. Therefore, a Chlorine Dosing System Consist of 100 Ltrs FRP Tank for Storage of Chlorine Solution along with necessary Nozzles, Instruments and Two Nos. (1W+1S) Chlorine Dosing Pumps of Capacity 4.0 LPH at Min Injection pressure of 5.0 kg/cm2 along with accessories & LDPE / CPVC Piping up to Dosing Point.

Table 28: Technical Specification of Chlorine Dosing System for Cooling Tower

CHLORINE DOSING SYSTEM	
Max Chlorine Dosage envisaged to complete oxidation of Fumic Derivatives, Pathogens, Viruses	1.5 ppm
Capacity of Chlorine Solution Dosing Tank	100 Ltrs
MOC of Dosing Tank	FRP
Dimensions (approx.)	As per OEM or to suit at site
Nozzles	Inlet, Outlet, Drain Overflow Nozzles
Instruments	Tubular Level Gauge with Isolation Valves
No of Chlorine Dosing Pumps	2 Nos. (1W+1S)
Capacity of the Pump	4 LPH at Min Injection Pressure of 5.0 Kg/cm2 or as per OEM
MOC of the Pump	All Wetted Parts PP / PVC
Piping	LDPE Tubing / CPVC Piping up to Injection Point

7 MCC, PLC CONTROL PANEL FOR THE PLANT

The MCC and PLC control panel to be provided shall be integrated cubicle type extensible sheet steel indoor type, floor mounted MCC panels. MCC shall be single front, Non-Draw out, with Copper Bus Bar, MCCB Incomer with hard relay logic for proposed system
The panel shall be suitable for 415V, 4 wire 50 Hz AC supply. The MCC shall be provided as described below including incoming, outgoing feeders, earthing etc. as per detailed technical specification and detailed design of all electrically operated equipment capacity with safety margins. The various electrical loads are listed here in the table which are minimum requirement.

The scope includes necessary cable alleys, space for spare switches, cable glands, terminations, trays, support structure, clamping, internal copper wiring with all accessories, internal power / control wiring / copper earthing between panels for all equipment including all necessary cables and other material. 1100V-grade rubber mat shall be provided in front of the panel board.

Motor Starter configuration shall be 415 VAC, MCCB, Contactors (DOL or Star/Delta starters) with OLR. MCC shall have ON &OFF Push Button, ON & OFF TRIP Lamps. LPBS shall be die cast aluminum and shall be provided only if distance exceeds 10m from the respective motor

Power cable up to 6 Sq mm shall be, 3 Core x Copper conductor, Armored, 1100V grade, PVC Insulated, FRLS type should be provided. The power cable above 6 Sq.mm size shall be, 3Core x Aluminum conductor, armoured, 1100V grade, PVC insulated FRLS shall be provided.

The cable shall be with maximum horizontal length ≥ 30 m between panel and respective load center. The control cable shall be 3 Core x 1.5 Sq.mm, Copper, multistrand flexible cables, non FRLS, maximum horizontal length shall be considered as 50m between two consecutive point of connections in the field. Existing Cable trays shall be used, wherever not existing GI Ladder type cable tray without cover of suitable sizes shall be provided. Cable gland shall be double compression type, MOC-SS
Instruments cable of suitable size and MOC shall be provided. maximum 20 m Horizontal length considered

a. All the feeders shall be provided with a Suitable interface scheme for remote monitoring (ON/OFF/TRIP) at SCADA. All Suitable interfaces shall be carried out up to marshalling chamber (located inside WPU plant room)
b. Quoted price shall include all internal wiring, cabling (power/control) and copper earthing inside the power panel etc. as LOT
c. The incoming feeders shall be with suitable rating TPN MCCB (4 pole) with microprocessor based S/C, O/C & E/F release with breaking capacity of 50kA (I_{sc}) at 440V AC/50Hz.
d. Digital Multi-function meter (Amp, Volt, Kwh, PF etc.).
e. Under, Over Voltage Relay and SPP/RPP,
f. a set of indicating lamps,
g. 4-20 mA voltage and current transducer for remote metering,
h. Suitable interface scheme for remote monitoring (ON/OFF/TRIP) at SCADA, and
i. Suitable interface scheme for local operation (ON/OFF/TRIP) with Phase indicating lamps shall be provided.
j. The outgoing feeders shall be as per the listed electrical loads which shall be finalized during the final phase of design. Each feeder for electrical motor shall be housed with suitable rating TP-MCCB, with Star-Delta or DOL starters, MPR with O/L, SPP, E/F relay.

k. All Feeder compartment shall contain Digital ammeter with selector switch, PB switches for ON/OFF and indicating lamps with fuse for ON/OFF and TRIP status of motor.
l. All electrical load shall be properly earthed on the skid with suitable size of copper wires/strips as required

Table 29: List of Electrical Loads connected

MCC & PLC Panel for WPS	Electrical Loads connected
MCC consist of Contactors, Relays, MCB's, DOL etc. for	Raw Water Feed Pumps, D G Water Transfer Pumps, DG Blowers, MB Blowers, DM Feed and transfer pumps, Regeneration Pump, Agitators, Chlorine Dosing Pumps, EDI Feed Pumps, WPU Feed Pumps, WPU- MB Blowers, Vacuum Pumps, waste water transfer pump etc. electrical load centers.
PLC Control with HMI	Conductivity Transmitters, Resistivity Transmitters, Vortex Type Flow Transmitters, Pressure Transmitters, Vacuum Switches, Pressure Switches, DM Water, EDI Water Storage Tanks & Levels, Control of EDI Feed Pumps, WPU Feed Pumps, Regeneration Water Feed Pumps, Vacuum Pumps, Control Valves in EDI & DO Removal Systems etc.
LPBS	One No for each Motor Each LPBS Consist of Start / Stop Push Buttons for Each Motor Mushroom Type Emergency Push button, Selector Switches, Run / Stop/ Trip indication Lamps etc.

7.1 PLC CONTROL WITH HMI

The SCADA of WPU shall be able to maintain and monitor desired Conductivity and dissolved Oxygen of ultra-pure water in WPU for catering to various Loops (Loop- 1,2,3,4 & 5). Although the conditions are to be maintained within the tolerance specified, but the system configuration should be such that even within the control band, the signal outputs from the system shall maintain the control variable nearest to the set point.

It is desired to network all the individual controllers, to a seamless communication BUS, with a view to monitor and centrally control the entire system. Further, through this system it shall also be possible to log all the data pertaining to all monitoring parameters on real time basis the SCADA/PLC of WPU shall be able to communicate with SCADA/PLC of Cooling Water System and should be able to provide all relevant data of WPU process equipments'status and various parameters to be closely observed on to CWS SCADA through LAN.

7.1.1 CONTROLLER SPECIFICATIONS

Table 30: Technical Specification of Main Controller

Sr. No.	Specification	Description
	Type of controller	PLC based
1	Digital display	On the Controller Fascia for the analog and digital parameters
2	Set point	Can be changed from the controller function keys
3	I/O density	Minimum parameter density as per specs
4	Supply voltage	240V AC± 15%;
5	Internal battery specification	Internal batteries shall be lithium with minimum 10 years of disconnected self-life and minimum 5 years of working life.
6	Serial Interfaces	Two optically isolated RS-485 interfaces on the CPU; 9600 Baud
7	Analog Inputs	Shall be 13-bit resolution; Input selectable via jumper for 0-10 V as well as 4-20 mA or RTD's 3-wire / 4-wire
8	Real Time Clock	Time in Hr. and Min; Date in Yr., Min, day. Auto calendar for day of week.
9	Scheduling modules	Optimal start stops modules
10	Exception days	Exception day (holiday) periods defined by begin and end date
11	Programmable Function Modules	PID Controller, ON/OFF controller, Avg. Calculation, Min/Max selection, Line Segment Function, Input selector, Calculator(liner/polynomial), 8 channel timer function, Totalization for 8 channels (of event, integration, run-time), Comparator for 8 channels, Sequencer (up to 8 output stages), Simple calculator (8 channels)
12	Programmed Logic Control	PLC module executing Boolean Functions: AND, AND NOT, OR, OR NOT, AND-Block, OR-Block, OUT/OUT NOT, Change of State, SET/RESET.

7.1.2 CONTROL AND MONITORING SYSTEM

The Central Control System for WPU should basically carry out the following functions:

1. Functionality required from Central Control System as operational requirements

    a. Online Data Base Generation of all parameters logged to the system.
    b. Commands to start, stop, override, set point changes, logic implementation, monitor/control, energy consumption.
    c. Monitor facility for alarms, I/O summaries and status for operator.
    d. Maintains Schedules of events and holidays.
    e. Power-Fail Restart to command Break Off points to scheduled states.
    f. 4 level Password Protection - monitor only, command, operate system level.
    g. Auto shut down on nuisance alarm reporting.
    h. Dial In out communications to connect to remote terminal for monitoring, control, and alarm messages.
    i. Printer Functions for maintaining hard copy records.
    j. Easy Data Base Generation and Configuration including trend history for energy analysis.
    k. Totalization Features
    l. Global Data Sharing
    m. Signal Select for averaging, HI/LO indications.
    n. Mimic generation package with color graphics.
    o. Data base transfer to allow operator to restore data to system or back up data to disk.
    p. Built –In RS Communications.
    q. Memory back up to Save and restore database.
    r. Self-diagnostics to warn operator of the error with full description

2. Design criteria

The Centralized Control System offered shall have the following features:

    a. State-of-the-art technology and use of open system computing and networking architecture.
    b. High level of reliability and availability for continuous satisfactory operation.
    c. Modularity.
    d. Expandability.
    e. Support to EMS software.
    f. Multi-platform support.
    g. Multi-user support.
    h. High speed data transfers.
    i. Multi-vendor Networking.
    j. On-line bi-directional Relational Database support.
    k. Scalable Application.
    l. Open access for Users and other programs.
    m. Flexible system integration.

n. Client/ Server architecture support.
o. LAN support.
p. AM/FM support

3. Operating system

The offered system shall be based on the state of the art 64-bit Windows 10 operating system with following features:

a. Multi-Tasking.
b. Multi User.
c. C2-level security.
d. Networking protocols support.
e. Graphical Users Interface (GUI).
f. DOS & WINDOWS emulation.
g. UPS support: The supplied UPS shall keep operating system running in the event of a mains power cut and lets your shutdown operating system correctly, thus avoiding any potential data loss. Operating System shall warn you when the main power fails and shall automatically shut down safely before the UPS itself runs down its batteries. There should be back up time of more than 30 min for PLC and work station.
h. Various Password support.
i. Development tools & Administration tools to be provided as part of the Operating System.
j. Support for object linking like Dynamic Data Exchange, Object Linking Embedding etc.

4. Software: SCADA

A software package shall be provided by the contractor for the development of Operator Interface, Alarm configuration and data archiving configuration etc. A PLC based plant control system and a modular fast data acquisition system with data logging time is required for this facility. This modular data acquisition system shall be integrated with SCADA Software and shall be integrated seamlessly.

All the application software shall be designed to be data- centric and not code- centric as far as practical. The settings which are expected to be changed, however rarely, in course of the plant system life time, should be made configurable without additional program recompilation and, preferably, without program restart.

Remote control functions for plant controller like reboot, configure, start, stop, switch to local shall be accessible from main control room.

An industry standard windows graphical configuration package shall be provided to configure the processor. It should be integrated, configured and set the I/O Parameters and control them in a real time when PLC is connected to the process.

SCADA software i.e. “Supervisory Control and Data Acquisition System software should allow an operator to make set point changes on distant process controllers, usually to control, monitor alarms, to analyses or report industrial automation applications. With SCADA, user should be able to collect

data from experimental facility's sensors and devices and transform them into dynamic text, alarm or graphic scheme. The SCADA should have functionality viz. Data Acquisition, Data Processing, Alarms, Data Archiving, Visualization, Controlling, Trending, and Reporting. The SCADA software should be able to connect with PLC as well as controllers.

7.1.2.1 General requirement

1. **SERVER Configuration & Software System**

i7, 3 GHz processor, Quad core CPU with 12 MB L3 cache.
16GB of RAM or higher VGA graphics card capable of 1280 x 1024-pixel resolution (or better) and
32-bit colors, non- interlaced (70 Hz or better vertical refresh rate) or higher with 21" LCD Color Display, 12 functions-key keyboards (English) with Mouse pointing device. 2X western Digital Raptor SATA Hard Disk Drive of 8 TB after RAID 5 configuration or higher complete with DVD +/- RW Drive Disk Drive.

A Network Interface Card (NIC) for Ethernet Networking compatible with TCP/IP network protocols (UTP & Fibre), with Antivirus, MS Windows Server Software and operating license and MS SQL Server License.

Vendor shall provide equivalent or with higher specs for server for operating the system. It shall be vendor's responsibility to provided efficient server as per site requirement to run the system without any lag/or delay.

2. **Workstation Software System**

A new graphics-based software system and Workstation shall be provided by the controls specialist. It shall consist at a minimum of:

i7 Quad Core 3.2 GHz processor, 12 GB of RAM,
21" LCD Colour Display (1280 x 1024) , 12 function- key keyboards (English) Mouse pointing device;
500GB X @ Mirrored HDD for OS & BMS Software
DVD Combo Drive
Graphics Card – one NVS 395 or higher version, 1024MB or better;
NIC (network interface card) for Ethernet Networking compatible with TCP/IP network protocols (UTP/fibre);
Complete with Antivirus, MS Windows Client Software and operating license; MS SQL CAL.

- The System shall support multiple Operators' Work Stations.
- The Workstation shall not function as a dedicated control device to the network. It shall be connected to the Plant network via standard network connection devices.
- **No. of SCADA workstations to be provided by the contractor: 1 no**.

The offered system shall be capable of the following data processing functions:

a. It shall be possible to perform mathematical calculations.

b. It shall be possible to perform logical operations.
c. It shall be possible to program control logic

The SCADA shall be able to perform mimic generation with uniform colour schemes. It should have a highly flexible database editor shall be provided for configuring analog channels that allow as many as approximately 28 fields to be changed/specified on-line. It should have graphical historical trending functions, report generation, daily deviation log functions, display of various alarms and events. The SCADA should be supported with suitable rating UPS to be able to perform and take backups during outage of normal power supply.

8 INSTRUMENTATION AND CONTROL

8.1 SCOPE

a. This specification covers the preliminary technical requirement of design, manufacture, inspection, testing, and guarantee of the instruments complete with accessories and auxiliaries as specified herein.
b. The scope of this section comprises the supply, erection, testing and commissioning of automatic controls and instruments conforming to these Specifications and in accordance with the Schedule of Quantities.
c. The vendor/contractor shall supply the instruments in accordance with this specification.
d. Compliance to this specification shall not relieve the vendor of the responsibility of supplying the instrument and auxiliaries of proper design, material and workmanship to meet the operating requirements specified herein and the Technical datasheet. In case any accessories that is necessary to make a complete, and enable to operate independent as well as controlled manner but not specifically identified herein shall also be in the vendor's scope of supply.
e. The vendor shall be responsible for the complete design, engineering, coordination, testing, packing, delivery and proper functioning of the instrument, notwithstanding any omissions in this specification.
f. Materials, processes and standard parts which are not specifically designated herein and which are necessary for fulfillment of the intent of this specification shall be of good quality and in accordance with good practice pertinent to the manufacture of precision industrial instrument and shall be subject to the approval of PURCHASER.
g. As the space available in the plant is limited, a design which reduces the overall size of the instrument is preferred. The weight of the instrument shall be as low as possible.
h. All necessary mounting hardware such as clamps, screws, brackets etc. depending on the mounting style shall be considered as a part of instrument and shall be supplied by the vendor.
i. IS system of units shall be used for all measurement, dial markings and in design drawings.

8.2 TYPE

All automatic controls shall be electro-mechanical controls as described in the various sections of these Specifications. The individual safety controls and selected automatic controls may be installed within the machines by the manufactures before shipment. However, the following automatic controls, if not already installed on the machines, may be installed at site by the contractor:

8.2.1 TECHNICAL DATA SHEET FOR INSTRUMENTS

This specification covers the minimum technical requirement of design, manufacture, inspection, testing, and supply with guarantee of the instruments complete with accessories and auxiliary as specified herein. It is not the intent to completely specify all details of design and construction of Pressure Gauge, temperature gauges, pressure transmitter, temperature transmitter, pH meter, DO meter, conductivity meter, level meter, Flow meters etc.; nevertheless, the instrument shall conform to high standards of engineering, design and workmanship in all respects.

Instruments required for different types of machines have been described in the various sections of these Specifications. All automatic controls and instruments shall be factory calibrated and provided with necessary instructions for site testing.

Following instruments shall be provided as per the requirements indicated in the Schedule of Quantities.

A. Pressure Gauge

Table 31: PRESSURE GAUGE

Type	Direct sensing
Pressure element	Bourdon
Pressure element material	SS316 or SS304
Unit of measurement	Kg/cm^2
Accuracy	±1 % of span
Pressure range	0-10kg/cm^2 (as per process requirement)
Repeatability	< ± 0.5 % of span
Range	Various range as per process requirement
Dial size	100
Scale length	270-degree arc
Dial color	White
Dial letter marking	Black
Pointer	Pointer stop on both side of the scale and should be of standard material
Pointer adjustment	Yes
Over range protection	Yes, 130% of full range pressure
Movement material	SS304
Socket and tip material	SS316
Case material	SS304
Enclosure class	IP65
Liquid fillings	As per requirements
Glass	Shatter proof borosilicate glass
Gasket material	EPDM
Process fluids	SOFT/DM water
Ambient Temperature range	10° C to +45° C

Case	Material
	Case finish
Pointer	Pointer stop on both side of the scale and should be of standard material
External zero span adjustment	Yes
Over range protection	Yes, 130% of full range pressure
Enclosure class	IP65
Liquid fillings	As per requirements
Glass	Shatter proof borosilicate glass
Ambient relative humidity	5% to 95%
Process fluid temperature	0° C to +100° C
Max. operating pressure	15 Kg/cm^2;
Fluid velocity	< 4 m/s
Process connection	½" NPT(M)
Siphon (if required0	SS316
3-way isolating needle valve	SS316

B. Temperature Gauge

Table32: TEMPERATURE GAUGE

Type		Bimetal
Mounting		Rigid stem
Sensing Element		Bimetallic helical/spiral coil
Unit of Measurement		°C
Calibrated Range		0 °C – 100 °C
Case Material		SS 304
Enclosure Class		IP 65
Dial Size		100
Color	Dial	White
	Letters & Markings	Black
Scale Length		270-degree arc
Pointer		Aluminum / Plastic, Anti-Parallax Pointer stop on both side of the scale
Pointer Assembly		With Micrometer Adjustment

Zero Adjustment in Pointer		Micro Zero Adjustment
Over Range Protection		130% of Full scale
Blow out Disk		Required
Glass window		Borosilicate shatter proof glass
Stem	Material	SS 316
	Length	As per requirement
Gasket/ Packing Material		EPDM
Ambient Temperature compensation		Required
Thermowell	Material	SS 304 or SS 316
	Dimension	To be submitted by the VENDOR
	Insertion opening for Gauge	½" NPT (F)
	Bore Concentricity	< 5% of wall thickness
Accuracy		±1.0% Full Scale, as per ASME B40.3 Grade A or

Pressure Transmitter

Table33: PRESSURE TRANSMITTER

Type		Electronic SMART
Pressure element		Capacitance type or single crystal silicone resonance sensor or similar
Sensing element material		SS316
Unit of measurement		Kg/cm^2
Wetted parts material		SS316
Pressure range		0-25 kg/cm^2 (as per process requirement)
Accuracy		±0.25 % of calibrated span or better
Repeatability		< ± 0.5 % of calibrated span or better
Hysteresis		< 0.05% of calibrated span or better
Dead band		< 0.1 % of calibrated span or better
Rangeability		10:1
Response time		< 1 sec.
Power supply		24 VDC, Loop powered
Signal connection		2-wire
Output signal		4-20 mA (HART) at 600 Ω load
Insulation resistance between signal terminal and casing		100 MΩ at 100 VDC
Local display		LCD
Vent and drain		Required
Case	Material	Die Cast low copper Aluminum
	Case finish	Polyurethane, Epoxy finish painted
Pointer		Pointer stop on both side of the scale and should be of standard material
External zero span adjustment		Yes
Over range protection		Yes, 130% of full range pressure
Enclosure class		IP65
Liquid fillings		As per requirements
Glass		Shatter proof borosilicate glass
Gasket material		Glass filled PTFE/ PEEK/ EPDM
Process fluids		SOFT/DM water
Ambient Temperature range		10° C to +45° C
Ambient relative humidity		5% to 95%
Process fluid temperature		0° C to +100° C
Max. operating pressure		< 15 Kg/cm^2; < 30 Kg/cm^2 for DNBHP
Fluid velocity		< 4 m/s
Process connection		½" NPT(M)
Cable gland connection		2 x ½" NPT (F), One of which shall be plugged
Cable length		Approx... 5 meter (atleast)

C. Temperature Transmitter

Table34: TEMPERATURE SENSOR CUM TRANSMITTER

Type		RTD- Pt100
Ro		100 Ω
Sensing element		High purity Platinum wire
RTD insert sheath material		SS 304 or SS 316
Unit of measurement		°C
Temperature range		0-100 (as per process requirement)
Electrical connection		4-wire
Element dimension		To be submitted by vendor
RTD assembly		To be submitted by vendor
RTD Head assembly	Case and cover material	Die cast Aluminium
	Cover chain	SS304
	Cable entry	½" NPT (F)
Thermowell	Material	SS 304 or SS316
	Dimension	To be submitted by vendor
	Opening for RTD	½" NPT (F)
	Bore connectivity	< 5% of wall thickness
Accuracy		Class A
Repeatability		< 0.5 % of Calibrated range
Local display		LCD display in ° C
Power supply		24 VDC
Input		From RTD
Signal output		4-20 mA DC
Enclosure class		IP65
Response time	RTD element	< 10 sec (without thermowell)
	RTD assembly	< 30 sec (with thermowell)
Gasket material		EPDM
Process fluids		SOFT/DM water
Ambient Temperature range		10° C to +45° C
Ambient relative humidity		5% to 95%
Process fluid temperature		0° C to +100° C
Max. operating pressure		15 Kg/cm^2
Fluid velocity		< 4 m/s
Process connection	Upto 150 mm	½" NPT(M)
	>150 mm	1" NPT(M)
Siphon (if required)		SS316
3-way isolating needle valve		SS316
Immersion length of RYD	Upto 150	75 mm
	200 mm-350 mm	150 mm
	400 mm- 500mm	250 mm
	Vessel	250 mm

assembly for lines		

D. Conductivity Meter and Transmitter

Table35: CONDUCTIVITY METER AND TRANSMITTER

Type		Two electrode resistance measurement, continuous, electronic analyzer
Cell constant		Vendor to specify
Unit of measurement		µS/cm
Measuring range		0 – 2 µS/cm, 0 – 10 µS/cm,
Resolution		0.01 µS/cm
Accuracy (Including conductivity cell)		± 1% of Calibrated Span or better
Repeatability		± 1% of Calibrated Span or better
Response time (Including conductivity cell)		< 10 Second
Separate provision for zero and span adjustment		Required
Transmitter housing	Type	Die Cast Aluminum
	Enclosure class	IP 65 according to IEC 60529
Local display		4 ½ digit LED / LCD display in µS/cm
Power supply		24 VDC
Input		From conductivity cell
Signal output		4-20 mA DC
Relay output		2 No. of SPDT Potential free contact for High/Low Alarms, Contact Rating of 1 AMP at 24 VDC, Adjustable throughout the range.
Input /output isolation		Required
Data logger facility		Yes
Temperature Compensation		Integral Temperature Sensor
Cell electrode material		SS 316
Cell body material		SS 316
Sensor Insertion length		Vendor to specify
Cable entry		½" NPT (F)
Power supply		24 VDC, Loop powered
Signal connection		2-wire
Output signal		4-20 mA (HART) at 600 Ω load
Insulation resistance between signal terminal and casing		100 MΩ at 100 VDC
Local display		LCD
Enclosure class/cell housing		IP65
Gasket material		PTFE/ PEEK/ EPDM

Process fluids	DM water
Ambient Temperature range	10° C to +45° C
Ambient relative humidity	5% to 95%
Process fluid temperature	0° C to +100° C
Max. operating pressure	15 Kg/cm^2;
Fluid velocity	< 4 m/s
Process connection	½" NPT (M) or better. Vendor to specify
Cable gland packing material	Graphoil
Diagnostic	Indication of Temperature Sensor Failure, Power Supply Failure, Sensor failure.

E. PH Meter and Analyzer

Table36: PH METER AND ANALYZER

Type		Electronic analyzer
Sensor type		Retractable glass electrode
Measurement type		Continuous
Unit of measurement		pH
Measuring range		0-14 pH
Resolution		0.01 pH
Accuracy		± 1% of Calibrated Span or better
Repeatability		± 1% of Calibrated Span or better
Response time		< 10 sec.
Sensor material		Glass Membrane, Glass Sensor Encapsulated In The Synthetic Material for Protection
Isolation valve type and material		Ball/gate valve of SS316
Isolation valve Packing material		Graphoil
Separate provision for zero and span adjustment		Required
Transmitter housing	Type	Die Cast Aluminum
	Enclosure class	IP 65 according to IEC 60529
Local display		LCD display in µS/cm
Power supply		24 VDC
Input		From conductivity cell
Signal output		4-20 mA DC
Relay output		2 No. of SPDT Potential free contact for High/Low Alarms, Contact Rating of 1 AMP at 24 VDC, Adjustable throughout the range.
Input /output isolation		Required
Data logger facility		Yes
Temperature Compensation		Integral Temperature Sensor
Cell electrode material		SS 316

Cell body material	SS 316
Sensor Insertion length	Vendor to specify
Cable entry	½" NPT (F)
Power supply	24 VDC, Loop powered
Signal connection	2-wire
Output signal	4-20 mA (HART) at 600 Ω load
Insulation resistance between signal terminal and casing	100 MΩ at 100 VDC
Local display	4 ½ Digit LED/LCD display in pH
Enclosure class/cell housing	IP65
Gasket material	PTFE/ PEEK/ EPDM
Process fluids	DM water
Ambient Temperature range	10° C to +45° C
Ambient relative humidity	5% to 95%
Process fluid temperature	0° C to +100° C
Max. operating pressure	15 Kg/cm^2;
Fluid velocity	< 4 m/s
Process connection	½" NPT (M) or better. Vendor to specify
Cable gland packing material	Graphoil
Diagnostic	Indication of Temperature Sensor Failure, Power Supply Failure, Sensor failure.

F. DO Meter and Analyzer

Table37: DO METER AND ANALYZER

Type		Electronic analyzer
Sensor type		Optical
Measurement type		Continuous
Unit of measurement		ppm
Measuring range		Suitable to measure the range
Resolution		0.01 ppm
Accuracy		± 1% of Calibrated Span or better
Repeatability		± 1 ppb or better
Response time		< 60 sec.
Sensor material		Glass Membrane, Glass Sensor Encapsulated In The Synthetic Material for Protection
Isolation valve type and material		Ball/gate valve of SS316
Isolation valve Packing material		Graphoil
Separate provision for zero and span adjustment		Required
Transmitter housing	Type	Die Cast Aluminum
	Enclosure class	IP 65 according to IEC 60529
Local display		LCD display
Power supply		24 VDC
Input		From conductivity cell
Signal output		4-20 mA DC
Relay output		2 No. of SPDT Potential free contact for High/Low Alarms, Contact Rating of 1 AMP at 24 VDC, Adjustable throughout the range.
Input /output isolation		Required
Data logger facility		Yes
Temperature Compensation		Integral Temperature Sensor
Cell electrode material		SS 316
Cell body material		SS 316
Sensor Insertion length		Vendor to specify
Cable entry		½" NPT (F)
Power supply		24 VDC, Loop powered
Signal connection		2-wire
Output signal		4-20 mA (HART) at 600 Ω load
Insulation resistance between signal terminal and casing		100 MΩ at 100 VDC
Local display		LCD
Enclosure class/cell housing		IP65

Gasket material	PTFE/ PEEK/ EPDM
Process fluids	SOFT/DM water
Ambient Temperature range	10° C to +45° C
Ambient relative humidity	5% to 95%
Process fluid temperature	0° C to +100° C
Max. operating pressure	15 Kg/cm^2;
Fluid velocity	< 4 m/s
Process connection	½" NPT (M) or better. Vendor to specify
Cable gland packing material	Graphoil
Diagnostic	Indication of Temperature Sensor Failure, Power Supply Failure, Sensor failure.

G. Level Transmitter

Table38: LEVEL TRANSMITTER

Type	Electronic SMART
Transmitter principle	Differential pressure
Pressure element	Capacitance type or single crystal silicone resonance sensor or similar
Sensing element material	SS316
Unit of measurement	mm
Wetted parts material	SS316
Accuracy	±0.25 % of calibrated span or better
Repeatability	< ± 0.5 % of calibrated span or better
Hysteresis	< 0.05% of calibrated span or better
Response time	< 1 sec.
Power supply	24 VDC, Loop powered
Signal connection	2-wire
Output signal	4-20 mA (HART) at 600 Ω load
Insulation resistance between signal terminal and casing	100 MΩ at 100 VDC
Local display	LCD
Vent and drain	Required
Enclosure class	IP65
Gasket material	Glass filled PTFE/ PEEK/ EPDM
Process fluids	DM water, Chiller water
Ambient Temperature range	10° C to +45° C
Ambient relative humidity	5% to 95%
Process fluid temperature	0° C to +100° C
Max. operating pressure	< 15 Kg/cm^2; < 30 Kg/cm^2 for DNBHP
Fluid velocity	< 4 m/s
Process connection	½" NPT(M)

Cable gland connection	2 x ½" NPT (F), One of which shall be plugged
Accessories	Direct Mounting five valve manifold for isolation pressure equalization & drain

H. Flow Transmitter

Table39: FLOW TRANSMITER

Type	Electronic smart vortex type
Sensing element material	SS316
Unit of measurement	Kg/s
Wetted parts material	SS316
Flange connection	Flanged as per ASME B16.5
Accuracy	±0.25 % of calibrated span or better
Repeatability	< ± 0.05 % of calibrated span or better
Hysteresis	< 0.05% of calibrated span or better
Dead band	< 0.1 % of Calibrated Span
Response time	< 1 sec.
Rangeability	10:1
Power supply	24 VDC, Loop powered
Signal connection	2-wire
Output signal	4-20 mA (HART) at 600 Ω load
Insulation resistance between signal terminal and casing	100 MΩ at 100 VDC
Local display	LCD
Vent and drain	Required
External zero span adjustment	Yes
Over range protection	Yes, 130% of full range pressure
Enclosure class	IP65
Gasket material	Glass filled PTFE/ PEEK/ EPDM
Process fluids	DM water, Chiller water
Ambient Temperature range	10° C to +45° C
Ambient relative humidity	5% to 95%
Process fluid temperature	0° C to +100° C
Max. operating pressure	< 15 Kg/cm^2; < 30 Kg/cm^2 for DNBHP
Fluid velocity	< 4 m/s
Process connection	½" NPT(M)
Cable gland connection	2 x ½" NPT (F), One of which shall be plugged
Accessories	Direct Mounting five valve manifold for isolation pressure equalization & drain
Pressure drop	≤ 0.3 Bar at 100% flow range

9 SECTION- IV INSPECTION, TESTING AND MEASUREMENT

9.1 INSPECTION, TESTING & ACCEPTANCE

Pre-dispatch inspection shall be carried out for certain items. All the system equipment, parts shall be checked for physical damage, before commencing the installation work. Complete fabrication, installation and commissioning work shall be jointly supervised and shall be carried out as per the specifications and instructions of IPR/IPR Engineer In-charge. All the rotating equipment shall be checked for static and dynamic balancing, minimum operating vibration and noise.

All the system / equipment shall be checked before / after satisfactory commissioning, at site as per he approved technical specifications, performance data provided by contractor / manufacturer. Actual capacity of equipment shall be calculated based on the test readings, recorded jointly, for design conditions / operating conditions. Performance acceptance is subject to comparison of test results with contractor / manufacturer's performance data and contract specification. Acceptance is subject to satisfactory Installation, commissioning and performance testing with respect to technical specifications. Rejected items must be replaced or rectified for the defects / performance. In case of system modification / rectification complete performance tests are to be repeated. Site test readings shall be jointly recorded.

In general, following Inspection / tests are involved. Type of test, duration of test, testing procedure / parameters, will be as per the applicable BIS codes. However, the detail Inspection and test procedure shall be worked out jointly by the purchaser and the contractor along with the approval of detailed design/drawings.

a. Pre-dispatch Inspection
b. Pre-dispatch testing at factory (material, dimensional check operation of controls.)
c. Physical Inspection – pre-installation at site.
d. Welding joint inspection and testing at site.
e. Pressure testing at site.
f. Performance testing at site. (Flow rate, design parameters at the outlet of individual unit (viz. conductivity, dissolved oxygen, pressure etc), power consumption, pressure drop, vibration, etc.)
g. Calibration at site

Table 31: Inspection, Testing and Acceptance

Sr. No.	Items/Equipment	Inspection/test involved
1.	Pumps	a, c, f
2.	Water Storage tank	a, b, c, e
3.	Piping – CS & SS	a, c, d, e
4.	Valves and strainers	a, c, e, f
5.	Electricals control panel Boards	a, b, c, f
6.	VFD, Motor,	a, b, c, f
7.	Instruments, control and Data Acquisition System	a, b, c, e, f, g

8.	MB unit. EDI Unit, DO Unit	a, b, c, f, g

- All the arrangement for the said inspection and testing must be made available at manufacturer's works/ site by the contractor at no extra cost. The purchaser shall be intimated sufficiently in advance for 'a' and 'b'.
- Pre-dispatch inspection and clearance issued by purchaser / representative of purchaser, will not relieve the contractor from responsibility of showing the performance of the integrated system at IPR site.

9.2 TEST CERTIFICATES

Contractor shall furnish following Test certificates:

- Material testing certificate of various components of the Equipment/ system parts.
- Fabrication inspection / test certificates– Radiography and others
- Welder's qualification certificate.
- Performance test certificates carried out by manufacturer before Pre- dispatch inspection & testing.
- Performance guarantee certificate. / Calibration certificate/ balancing certificate.
- Performance curves of all equipment, along with operation and maintenance manual.

9.3 FACTORY ACCEPTANCE TESTING

The factory Acceptance testing (FAT) guarantees that the equipment is complying with all the requirements and are ready to be dispatched without any problem the contractor shall offer various drawings like GA, P&ID, and electrical & instrumentation drawings for review and verify by the representative of customer in the factory for their correctness.

9.4 SITE INSPECTION AND TESTING

All the tests shall be carried out by contractor in the presence of the representative of IPR. All manpower, instruments, services, required for the tests shall be provided by the contractor. All the system components (Including the parts cleared after pre-dispatch inspection and testing) will be physically inspected and tested before and after installation according to approved specifications and drawings.

Capacity ratings and power consumption with operating points clearly indicated shall be submitted and verified at the time of testing and commissioning of the installation. Manufacturer's tests certificates shall be furnished for all equipment / materials.

The contractor shall demonstrate the capacity and the power consumed by the equipment. The contractor shall also demonstrate the proper operation of all controls, Instruments and other equipment. Hydrostatic test for all pressure piping shall be carried out. Alignment of drives, checking of vibration isolation, running tests for pumps, etc. shall be carried out.

Water piping shall be tested to hydraulic test pressure of at-least one and half (1.5) times the maximum operating pressure, but not less than 10 Kg/cm2, for a period of not less than 4 hours. Any leaks, defects shall be rectified and re-tested in same manner. After completion of the installation, all water system equipment such as pumps, valves, instruments etc. shall be adjusted and balanced to deliver the water as specified.

9.5 EQUIPMENTS/COMPONENTS/ITEMS TESTING

Following equipment shall be tested for performance at site:

MB unit, EDI and DO units including Pumps, , valves, actuators, motors, VFDs, MCCs, Control Panels, DACs, entire piping network, power and control cabling networks, earthing network, instruments and controls etc. All individual equipment/components/items shall be tested according to the relevant test standards, approved procedures, criteria and test conditions covered in respective equipment/components/items Quality, Inspections, testing and acceptance chapters/paragraphs.

9.6 ACCEPTANCE

System components or system as a whole shall be tested at site by contractor for performance as per the approved technical specifications. System can be accepted and taken-over by the Purchaser for regular operation only after satisfactory performance testing in all respect. All the system components shall meet the guaranteed performance requirements to the satisfaction of the Purchaser. Necessary replacement / modification / rectification shall be carried out with the approval of Engineer In-charge. The installation shall be tested again after removal of defects (if any) and shall be commissioned only after approval by the Engineer In charge.

The following aspects shall be considered for performance testing:

a. Prevailing conditions shall be as close as to design conditions.
b. Type, quantity, location, frequency, duration of test parameters shall be decided and recorded accordingly during the test.
c. Rated capacity, power consumption, and other operating parameters shall be checked.
d. Functional test for all Instruments, controls (safety and capacity) and DACS shall be carried out to check for the expected operation / action / accuracy / response time / repeatability parameters.

10 PAINTING COLOUR CODE

All Equipment shall be supplied with approved colour finish. Shop coat of paint that have become marred during shipment or erection shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with two coat of synthetic enamel paint. Pump base-plate / piping supports subject to water exposure to be painted with rubber paint using zinc base primer. The Colour code for identification of piping shall be as per IS: 2379.

All Pipes and structure steel work shall undergo a process of degreasing, thorough cleaning, and painting with a high corrosion resistant primer. All panels shall be baked in an oven. The finishing treatment shall be by application of synthetic enamel paint of approved shade.

10.1 STANDARD COLOUR CODE

The tentative colour code given below shall be followed. However, changes if any will be indicated well in advance. All painting colour code shall be approved before execution.

Table 322: Standard Color code

Item	Colour
▪ Electrical panel ▪ All supports / Stands / drain ▪ All piping should be having direction arrow	▪ RAL 7035 ▪ Black ▪ Black

All shade shall be duly approved by IPR Engineer In-charge/ personnel

11 MINOR CIVIL WORKS

For all equipment covered in this tender, following civil works shall be included:

a. RCC Floating / Fixed foundation blocks lined with MS angle on edges, pedestals for all Equipment like MB unit, EDI and Oxygen removal units, Pumps, Blowers, storage tanks, and Electrical panel etc. of adequate size at site as per the recommendation of equipment manufacturer.

b. Other Civil and associated works require to be carried-out for the Erections / Installations of all the Equipment, piping work etc.

c. Construction of suitable size of waste water disposal tank with acid proof tiling/lining on all walls/floor and slabs as per the design/ site requirement.

d. Providing acid proof tiling work on the floor below equipment wherever required as per design/site requirement including providing sufficient slope and connecting to waste water collection tank/underground sump with interconnecting PVC/HDPE piping of suitable size.

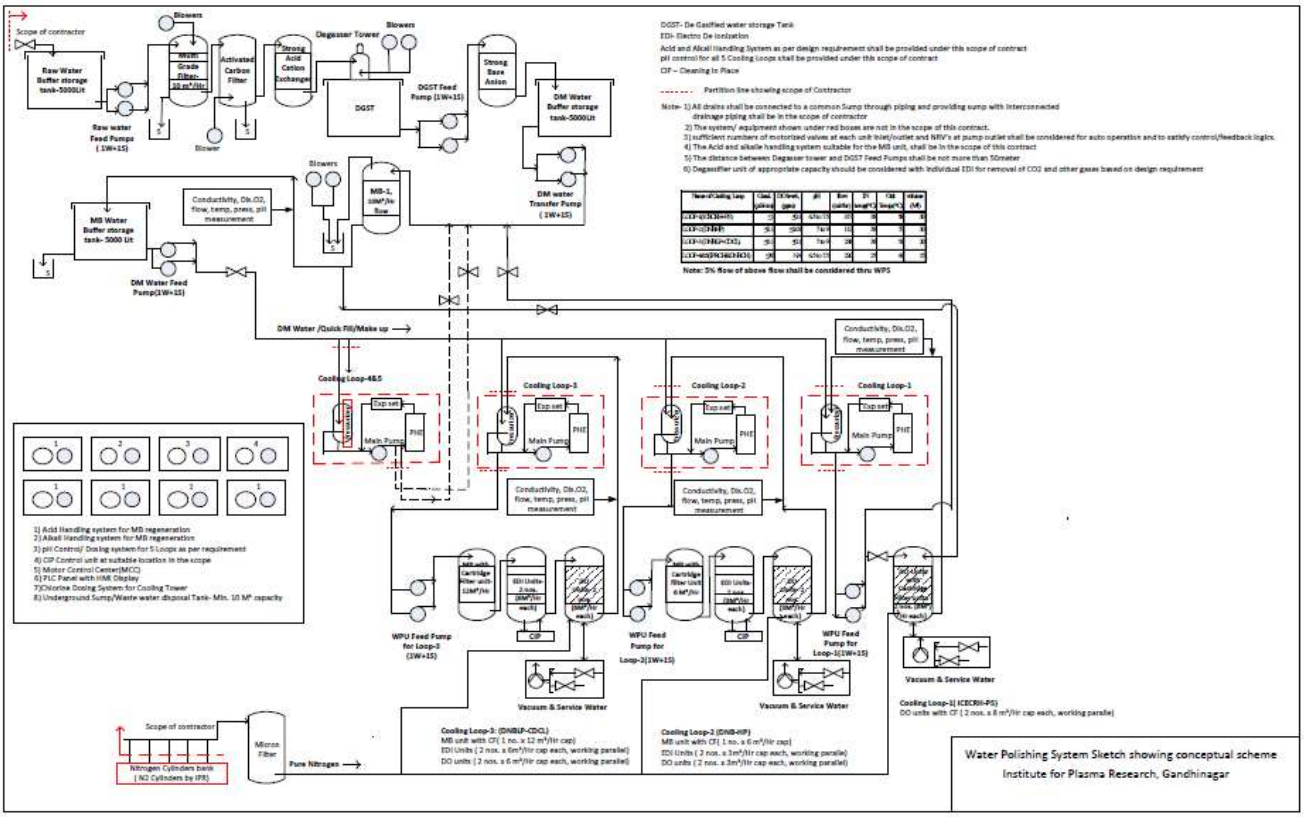
The above includes making, cutting and finishing of holes in roof / floor/ wall, opening for cables, pipe crossings etc. and making good of them. This shall also include digging and refilling work/s and minor civil work required., grouting of supports and finishing good of them.

12 SCHEDULE OF DELIVERY

The delivery schedule/project completion to be followed as below:-

Sr. No.	Time	Milestone
1.	T0	Date of Contract/Purchase Order
2.	T1= T0 + 3 Months	Submission of Design Documents, Drawings & Quality Plan (QP) for IPR Approval
3.	T2= T1 + 1 Month	Approval of Design Documents, Drawings & QP by IPR
4.	T3= T2 + 14 Months	Supply, Installation, Testing & Commissioning, Site Acceptance Test and Final Acceptance at IPR site

13 CONCEPTUAL SCHEME OF WATER POLISHING SYSTEM



14 TECHNICAL DATASHEET ANNEXURES

Annexure 1: Raw Water Feed Pumps-DM Plant

Sr.	Details	Preliminary	Vendor to provide data
1.1	No. of Pumps with Motor	-2 Nos. (1w + 1s)	
1.2	Type of Pump	-Centrifugal Horizontal Back Pull	
1.3	Capacity/ Head	-10 M^3/Hr / 40 m	

Annexure 2: Multi Grade Filter- DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
3.1	No. of Streams	One No.	
3.2	Model	As per OEM	
3.3	Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends	
3.4	Design Pressure	As per OEM	
3.5	Diameter of Vessel in mm	As per OEM	
3.6	H.O.S. in mm	As per OEM	
3.7	Shell & dish end Thickness	Shell & Dish end thickness 6 /8 mm	
3.8	Flow Rate	10 M^3/hr	
3.9	No. of Air Scoring Blowers with accessories	2 Nos. (1W+1S)	
3.10	Instruments	As per technical specification and design requirement	

Annexure 3: Activated Carbon Filter -DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
4.1	No. of Streams	One No.	
4.2	Model	As per OEM	
4.3	Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends	
4.4	Diameter of Vessel in mm	As per OEM	
4.5	H.O.S. in mm	As per OEM	

4.6	Shell & dish end Thickness	As per design Shell & Dish end thickness shall be 6 /8 mm	
4.7	Flow Rate	10.0 M^3/hr	
4.8	Instruments	As per technical specification and design requirement	

Annexure 4: Strong Acid Cation Exchanger- DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
5.1	No. of Streams	One No.	
5.2	Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends	
5.3	Material of Construction	CSRL	
5.4	Diameter of Vessel	as per OEM	
5.5	H.O.S.	as per OEM	
5.6	Design Working Pressure	as per OEM	
5.7	Shell & dish end Thickness	As per design Shell & Dish end thickness shall be 6 /8	
5.8	Normal Flow Rate	10 M^3/hour	
5.9	Output per regeneration / Per Stream	200 M^3	
5.10	Resin Quantity	Indicate in Liters.	
5.11	Type of Resin	As per OEM	
5.12	Hydro Chloric Acid required per Regeneration	Indicate in Kgs as 33%	
5.13	Instruments for Each Stream	As per technical specification and design requirement	

Annexure 5: D M Water Storage Tank and Pumps- DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
6.1	Degasser Tower		
A	Working Pressure	Atmospheric	
B	Diameter of Degasser Tower in mm	as per OEM	
C	H.O.S. of Degasser Tower in mm	as per OEM	
D	Normal Flow Rate	10 M^3/hr	
E	M.O.C.	CSRL	
6.2	DEGASSER AIR BLOWERS		
A	Blower Capacity	Indicate in M^3/min @ 100mm WG	
B	No. of Blowers	Two (1W+1S)	
C	Type of Blower	Centrifugal	
6.3	D MWater storage tank-Qty/ Capacity in Cu M	1 No./ 5Cu M	
A	MOC of the DM Storage Tank	SS-304	
B	Dia of the DM Storage tank	as per OEM	
C	L.O.S. of Storage Tank	as per OEM	
6.4	D M WATER TRANSFER PUMPS WITH MOTOR		
A	Capacity / Head in M	10 M^3/hr at OEM specified head	
B	No. of Pumps	Two Nos. (1w+1s)	
C	Type of Pump	Horizontal Centrifugal Back Pullout type.	
D	MOC	Casing, Impeller, Shaft – AISI-316, Mechanical Seal – AISI-316, Base Plate – Fabricated Steel.	
E	Suction Isolation Valves	2 Nos,	
F	Discharge Isolation Valve & NRV	2 Nos.	
G	Instruments	As per technical specification and Design requirement	

Annexure 6: Strong Base Anion Exchanger- DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
7.1	No. of Streams	One No.	
7.2	Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends	
7.3	Material of Construction	CSRL	
7.4	Diameter of Vessel	as per OEM	
7.5	H.O.S.	as per OEM	
7.6	Design Working Pressure	as per OEM	
7.7	Shell & dish end Thickness	As per design Shell & Dish end thickness shall be 6 /8 mm.	
7.8	Normal Flow Rate	10 M^3/hour	
7.9	Net Output per regeneration / Per Stream	200 M^3	
7.10	Resin Quantity	indicate Liters.	
7.11	Type of Resin	As per OEM	
7.12	100% Caustic required per Regeneration	indicate kgs	
7.13	Instruments for Each Stream	As per technical specification and Design requirement	

Annexure 7: Mixed Bed Polishing Unit-DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
8.1	No of Streams	One No.	
8.2	Material Code	CS as per IS: 2002 (Gr.2 B / SA 515-516 GR 70) for Shell and Dish ends	
8.3	Material of Construction	CSRL	
8.4	No of Streams	One	
8.5	Diameter of Vessel in mm	as per OEM	
8.6	H.O.S. in mm	as per OEM	
8.7	Design Working Pressure	as per OEM	
8.8	Normal Flow Rate	10.0 M^3/hour	
8.9	Shell & dish end Thickness	As per design Shell & Dish end thickness shall be 6 /8 mm,	
8.10	Output per regeneration / Per Stream	Indicate in M^3 min.	
8.11	Type of Resin	As per OEM	
8.12	Resin Qty.	indicate in liters	
8.13	Instruments for Each Stream	as per technical specification and design requirement	

Annexure 8: Mixed Bed Blower- DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
9.1	Capacity	-indicate M^3/hour	
9.2	Pressure	-Indicate Kg/cm2	
9.3	Quantity	-Two Nos. (1W+1S)	

Annexure 9: MB Water Storage Tank- DM Plant

Sr.	Details	Preliminary Description	Vendor to provide data
10.1	Buffer Storage Tank	Min 5 M^3	
10.2	MOC of the Storage Tank	FRP / MSRL	
10.3	Dimensions	as per OEM	
10.4	Qty.	1 No.	
10.5	Accessories	as per technical specification and design requirement	
10.6	Blanketing System	as per technical specification and design requirement	

Annexure 10: DM Water Feed Pumps- DM Plant

Sr.	Details	Preliminary Description	Vendor to provide
11.1	No. of Pumps with Motor	2 Nos. (1W + 1S)	
11.2	Type of Pump	Centrifugal Horizontal Back Pull Out	
11.3	MOC	SS 316	
11.4	Capacity	5.0 M^3/Hr. each	
11.5	Head	30.0 meter or suitable	
11.6	Valves, accessories and instruments	as per technical specification and design requirement	
11.7	Suction & Discharge Piping	MSRL as per IS 2825	

Annexure 11: WPU Feed Pumps

Sr.	Details	Preliminary Description	Vendor to provide data
12.1	No. of Pumps with motor/ Head	-2 nos. with 16 M^3/hr flow rate at 40 M or suitable head for Loop-1 -2 nos. with 6 M^3/hr flow rate at 40 M or suitable head for Loop-2 -2 nos. with 12 M^3/hr flow rate at 40 M or suitable head for Loop-3	
12.2	Type of Pump	Centrifugal Horizontal Back Pull Out	
12.3	Valves, accessories and instruments	as per technical specification and design requirement	
12.4	Suction & Discharge Piping	Complete SS 316	

Annexure 12: Cartridge filter Unit- WPU Plant

Sr.	Details	Preliminary Description	Vendor to provide data
13.1	No. of Streams	One Stream (min.) with following capacity j) 8M^3/hr flow rate for Cooling Loop-1 ii) 6M^3/hr flow rate for Cooling Loop-2 iii)12M^3/hr flow rate for Cooling Loop-3	
13.2	Design Pressure	As per OEM	
13.3	MOC of Cartridge Filtration Unit	Complete in SS 316	
13.4	No of Filter units in Cartridge	as per OEM	
13.5	Cartridge Dimensions	as per OEM	
13.6	Inlet & Outlet Piping, valves	SS 316	
13.7	Accessories and instruments	as per technical specification and design requirement	

Annexure 13: Mixed Bed Unit- WPU Plant

Sr.	Details	Preliminary Description	Vendor to provide data
14.1	No of Streams	One No. (Cooling Loop 2) One No. (Cooling Loop 3)	
14.2	MOC of the MB	SA 515-516 GR 70) for Shell and Dish ends	
14.3	Diameter of Vessel in mm	as per OEM	
14.4	H.O.S. in mm	as per OEM	
14.5	Design Working Pressure	as per OEM	
14.6	Normal Flow Rate	$6M^3$/hour (Cooling Loop-2) $12M^3$/hour (Cooling Loop-3)	
14.7	Shell & dish end Thickness	as per design Shell & Dish end thickness shall be 5 /7 mm,	
14.8	Internal & External Protection	Mirror Polished preferred	
14.9	View Glasses	2 Sets with necessary Mounting arrangement	
14.10	Type of Resin	as per OEM	
14.11	Resin Qty	Indicate liters	
14.12	Cation & Anion Resin Type	as per OEM	
14.13	Piping & Valves	Frontal- MSRL, interconnecting piping-SS-304, Valves-SS 316 & SS Diaphragm Valves	
14.14	Instruments for Each Stream	as per technical specification and design requirement	

Annexure 14: Mixed Bed Blower- WPU Plant

Sr.	Details	Preliminary Description	Vendor to provide data
15.1	Capacity	indicate M^3/hour	
15.2	Pressure	indicate Kg/cm2	
15.3	Quantity	One No. with motor	
15.4	MOC	CI	

Annexure 15: EDI System

Sr.	Details	Preliminary Description	Vendor to provide data
16.1	DI Module	High Flow, High Recovery Module.	
16.2	Quantity	i) One EDI set for Cooling Loop-2 with 2 parallel streams of 3M^3/hr flow rate ii) One EDI set for Cooling Loop-3 with 2 parallel streams of 6M^3/hr flow rate	
16.3	MOC	As per technical specification.	
16.4	Piping & Valves	Complete in SS 316 L	
16.5	EDI Skid	Complete in SS 316 with all support accessories	
16.6	Accessories and instruments	as per technical specification and design requirement	
16.7	Cartridge Filter Unit	SS 316 L Housing & 1 Micron Rated Filter Cartridges	
16.8	Cleaning system with Cleaning Pump & motor	Portable type, as per OEM specification	
16.9	PLC, HMI and Control	As per OEM and technical specifications and design requirement	

Annexure 16: Dissolved Oxygen removal System- WPU Plant

Sr.	Details	Preliminary Description	Vendor to provide data
17.1	Number of streams	a) 2 streams of 8 M^3/hr for Loop-1 b) 2 streams of 3 M^3/hr for Loop-2 c) 2 streams of 6 M^3/hr for Loop-3	
17.2	Housing Type	SS316	
17.3	Membrane Type & Configuration	Microporous, Hydrophobic, Hollow fibers	
17.4	Design Temperature, Deg C	25-40	
17.5	Operating Mode	Vacuum + Nitrogen Sweep	
17.6	N2 Sweep Gas required flow Rate	As per OEM	
17.7	MOC of Membrane Skid	SS 316	
17.8	Complete Piping & Valves in the System	SS 316	
17.9	Accessories and Instruments	as per technical specification and design requirement	
17.10	N2 Flow Control System	as per technical specification and design requirement	
17.11	Vacuum System	as per technical specification and design requirement	

Annexure 17: Chlorine Dosing System

Sr.	Details	Preliminary Description	Vendor to provide data
2.1	Max Chlorine Dosage envisaged to complete oxidation of Fumic Derivatives, Pathogens, Viruses	1.5 ppm	
2.2	Capacity of Chlorine Solution Dosing Tank	100 Ltrs	
2.3	MOC of Dosing Tank	FRP	
2.4	Instruments	as per technical specification and design	
2.5	No of Chlorine Dosing Pumps	2 Nos. (1W+1S)	

2.6	Capacity of the Pump	4 LPH at Min Injection Pressure of 5.0 Kg/cm2	
2.7	MOC of the Pump	All Wetted Parts PP / PVC	

Delivery Schedule

01	Delivery	18 Months from the date of Contract/PO (for more details, refer clase No. 12 above)	

Authorized Singatory

Official Seal

Date :

SECTION 'E':

PRICE SCHEDULE

Validate Print Help

Item Rate BoQ

Tender Inviting Authority: Head - Purchase Section

Name of Work: Design, Engineering, Fabrication, Supply inlcuding unloading, installation & commissioning, testing and site accceptance at IPR site of WATER POLISHING SYSTEM comprising DM plant, EDI units with oxygen removal (membrane contactor type) system comprising of all necessary equipment, interconnected piping, valves with actuators, support structures, instrumentation with electricals (MCC/LPBSs) , power and instrumentation cabling, wiring, earthing, and PLC based monitoring Data Acquisition and Control System (SCADA) comprising of software and hardware, including construction of waste water disposal tank and minor civil works as per the details mentioned in technical specifications of the tender document

Tender No. IPR/TN/PUR/TPT/ET/22-23/002 Dated 08/06/2022

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	**Design, Engineering, Fabrication, Supply, installation & commissioning, testing and site accceptance at IPR site of WATER POLISHING SYSTEM comprising DM plant, EDI units with oxygen removal (membrane contactor type) system comprising of all necessary equipment, interconnected piping, valves with actuators, support structures, instrumentation with electricals (MCC/LPBSs) , power and instrumentation cabling, wiring, earthing, and PLC based monitoring Data Acquisition and Control System (SCADA) comprising of software and hardware, including construction of waste water disposal tank and minor civil works as per the details mentioned in technical specifications of the tender document**					
1.01	Design, Engineering, Fabrication, Supply inlcuding unloading of WATER POLISHING SYSTEM comprising DM plant, EDI units with oxygen removal (membrane contactor type) system comprising of all necessary equipment, interconnected piping, valves with actuators, support structures, instrumentation with electricals (MCC/LPBSs) , power and instrumentation cabling, wiring, earthing, and PLC based monitoring Data Acquisition and Control System (SCADA) comprising of software and hardware, including construction of waste water disposal tank and minor civil works as per the details mentioned in technical specifications of the tender document	1.000	Set.		**0.00**	INR Zero Only
1.02	Installation & commissioning, testings and site acceptance at IPR site of above systems as per the details mentioned in technical specifications of the tender document	1.000	Job		**0.00**	INR Zero Only
Total in Figures					**0.00**	INR Zero Only
Quoted Rate in Words		**INR Zero Only**				