

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

Phone: 079 23962022

Fax: 079 23962277

TENDER NOTICE No. IPR/TPT/TN/PUR/F/16-17/8 DATED 03-08-2016

Sealed tenders are invited in TWO PARTS from the eligible vendors for the following item.

Sr. No	Tender Notice No.	Item	Qty.	Due Date & Time for		Tender Fee	Earnest Money Deposit (EMD)
				Submission of tender	Opening of tender		
1.	IPR/TPT/TN/PUR/F/16-17/8 (TWO PART TENDER)	“Process Design, Fabrication, Factory Acceptance Tests, Supply, Installation & Commissioning, Site Acceptance Tests and Training of 900 W @ 4.5K Helium Refrigeration (HR) System at IPR.”	1 System.	21 th September, 2016 by 13.00 Hrs. I.S.T.	21 th September, 2016 by 14:30 Hrs. I. S. T.	Rs. 1000.00 OR USD 15.00 OR Euro 14.00	Rs. 5,00,000.00 OR USD 7463.00 OR Euro 6627.00

1. For further details, please visit IPR Website : <http://www.ipr.res.in/documents/tenders.html>.
2. Interested parties may download the tender documents & submit their quotation, if they fulfill the eligibility criteria
3. Tender documents will also be issued from this office upto 16-08-2016. Interested parties may approach us with tender fee.

INSTITUTE FOR PLASMA RESEARCH
NEAR INDIRA BRIDGE, BHAT
GANDHINAGAR: 382428
GUJARAT STATE
(INDIA)

Tele No. +91-79-2396-2000 / 2022-26
E-mail : bkbsrao@ipr.res.in, alpesh@ipr.res.in

Fax No. 91-79-2396-2277

Tender No. IPR/TPT/TN/PUR/F/16-17/8
BID DUE DATE 21st September, 2016
Time : 13:00 Hrs IST.

TWO-PART TENDER

M/s _____

Dear Sirs,

Sub: Purchase of **“Process Design, Fabrication, Factory Acceptance Tests, Supply, Installation & Commissioning, Site Acceptance Tests and Training of 900 W @ 4.5K Helium Refrigeration (HR) System at IPR.”**

This document contains Invitation to tender, tendering conditions, contracting conditions and specifications of stores required by us. The tenders in respect of this case are to be submitted in TWO-PARTS. If you are interested to quote, please go through the contents particularly the tendering conditions and ensure that your quotation reaches us on or before the due date indicated above.

Yours faithfully,

BKBS Rao
Purchase Officer-II

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GANDHINAGAR: 382428
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(INDIA)

Tele No. +91-79-2396-2000 / 2022-26

Fax No. 91-79-2396-2277

E-mail : bkbsrao@ipr.res.in, alpesh@ipr.res.in

INSTRUCTION SHEET

Instructions to Tenderers indicating the Tender Number, Last Date and Time for Receipt of Tender, place at which the Tender can be submitted and the Date/Time and Venue in which Tenders will be opened.

Tender No. IPR/

I	Last Date for reaching both Part - I (Technical & Commercial) and Part - II (Price) of the Tender in Sealed envelopes to Institute for Plasma Research to reach on or before the last date & time.	13:00 Hours (IST) on 21st September, 2016
II	Due Date and Time for Opening of Part-I of the Tender i.e. Techno Commercial Part	14:30 Hours (IST) on 21st September, 2016
III	Venue for Opening the Tender	Institute for Plasma Research Nr. Indira Bridge Bhat, Gandhinagar-382428 Gujarat

SECTION – ‘A’ INVITATION TO TENDER AND TENDERING CONDITIONS

Part I – Techno – Commercial

All commercial & Technical aspects to be given in Part-I

Part – II – Only Price to be given

TWO PART TENDER

SECTION - A

INVITATION TO TENDER AND TENDERING CONDITIONS

ELIGIBILITY CRITERIA:

- I. Bidder must have experience of at least 10 years for design, fabrication, installation and commissioning of large scale (kW class) cryogenic helium plant. *At least one un-priced purchase order copy of an installation carried out on or before year 2005 shall be submitted as proof.*
- II. The bidder should have supplied and installed more than ten (10) cryogenic helium plants across the world. *Summary list of cryogenics helium plants with key information shall be submitted.*
- III. The bidder must have technology know-how and R & D facility of cryogenic expansion turbines manufacturing and development. *Relevant support documents shall be submitted as proof.*
- IV. The bidder must have installed and commissioned at least two helium refrigerators or liquefiers of 400 W @ 4.5 K cold capacity or higher as a turn-key system to any government or reputed private organization in India. *Relevant un-priced purchase order copies and client completion certificates shall be submitted by the bidder as proof.*
- V. Average Annual turnover of the bidder for last 5 years shall be 350 Million Indian Rupees (INR) or equivalent. *Relevant documentation such as audited balance sheet or certified annual sales turnover statement shall be submitted by the bidder as proof.* Bidder should have not made losses in more than 2 years during last 5 years.

Note: The bidders are required to provide their response to essential eligibility criteria with documentary evidence in the form of un-priced purchase orders, installation reports, catalogues etc., detailing the system manufactured with major technical details therein.

1.0 INVITATION TO TENDER

1.1 IPR, Invites sealed tenders in quadruplicate for supply of plant, machinery, equipment, component to the specifications detailed in Section 'C' to this tender document. The conditions of contract which will govern the contract pursuant to the tender are as contained in form no. IPR-FP-12 which is Section 'B' of this tender document. If you are in a position to quote for supply in accordance with the technical specifications indicated in Section 'C' to this tender document and as per conditions in this section and Section 'B' please submit your offer in a manner and method specified below:

1.2 MANNER AND METHOD FOR SUBMISSION OF OFFERS

1.2.1 LANGUAGE OF OFFERS

1.2.1.1 All tenders shall be made in ENGLISH in the prescribed form attached. Tenders submitted in any language other than English must be accompanied by English translation.

1.2.2 All tenders in response to this invitation shall be submitted in TWO-PARTS and in different envelopes. All technical specifications and technical details along with commercial aspects shall be included only in Part-I of the tender, which is hereinafter referred to as Part-I, while all details relating to price shall be included only in Part II which is hereinafter referred to as Part II (Price).

1.2.3 Part – I (Techno-commercial) should contain/include only technical specifications, technical details, literature, references to earlier supplies of similar equipment, drawings, quantity, time required for submission and approval of drawings, manufacturing and delivery schedule, inspection/testing procedures, etc. Itemised list of spares and the quantity recommended by the tenderer for purchase should also be included in Part-I (Techno-commercial) of the tender without their price details. However the itemized price of spare parts should be furnished only in Part- II (Price) of the tender. The Part-I (Techno-commercial) shall be enclosed separately, duly sealed and super scribed with Tender Number and the last date and time for receipt indicated in the instruction sheet of the tender document to reach on or before the last date and time indicated in the instruction sheet of this tender document. The tenderer shall take special care not to mix up price with Part-I (Techno-commercial).

1.2.4 All details relating to price, price break-up, formula for price variation/escalation, Inland transportation/documentation, freight charges, delivery term (F.O.B. / F.C.A.) mode and terms of payment, mode of dispatch and all related commercial terms and conditions should be included only in Part-II (Price)of the tender. Any violation of this condition will result in outright rejection of the tenders. This part of the tender i.e. Part II(Price) shall be enclosed separately and shall be sent duly sealed and super scribed with tender number and the last date and time for opening indicated in the instruction sheet of this tender document.

1.2.5 The tender will co-relate the prices in Part-II of the tender with the description of the stores indicated in Part-I (Techno-commercial) by allotting a running serial number in order to enable the Purchaser to identify the prices with the relative items in Part –I (Techno-commercial).

1.2.6 Part-I (Techno-commercial) and Part-II (Price) should be enclosed in a common envelope. This envelope should again be sealed and super scribed with tender number and last date and time for receipt indicated in the instruction sheet of this tender document and should reach the IPR.

1.3 OPENING OF TENDERS

1.3.1 Unless otherwise preponed, or postponed with advance intimation to the tenderers, tender will be opened in two stages at IPR on the date and time indicated in the instruction sheet of this tender document.

1.3.2 Both the tenders will be opened in the presence of the tenderers, who wish to participate in the opening of the tenders or their authorized representatives. Tenderers, who wish to participate in the opening of Part-I (Techno-commercial) may depute their representatives to IPR on the respective dates and time and venue as indicated in the instruction sheet of this document.

1.4 TECHNICAL CLARIFICATIONS

1.4.1 After opening of Part-I (Techno-commercial) of the tender, if it becomes necessary for IPR to seek clarifications from the tenderers, the same will be sought for from the tenderers. In such an event the tenderer shall furnish:

1.4.1.1 Any technical and commercial questions, information, clarifications etc. that may be required pertaining to this tender may be obtained from the Purchase officer. Bidder will send the request for such clarifications to the Purchase Officer minimum 10 working days prior to the due date to submit the bid.

1.4.2 Irrespective of the circumstances whether technical clarifications have been sought for or not from any other tenderers, the tenderers will be free to ask technical clarification concerning the scope details of the tender etc. if they so consider it necessary.

1.4.3 Copies of correspondence sent to the Purchase Officer, IPR relating to price and other related commercial terms and conditions should not be endorsed to the technical authorities.

1.5 VALIDITY OF OFFERS

1.5.1 Offers shall be kept valid for acceptance for a period of 120 (One Hundred Twenty) days from the date of actual opening of Part-II (Price) of the tender. Offers with shorter validity period will be liable for rejection.

1.6 CATALOGUES/TECHNICAL LITERATURE

1.6.1 All necessary catalogues/drawings technical literature data as are considered essential for full and correct evaluation of the offers shall invariably accompany the Part-I (Techno-commercial) of the tender.

1.7 TERMS AND CONDITIONS OF THE CONTRACT

1.7.1 It must be clearly understood that any contract concluded pursuant to this invitation to tender shall be governed by the General Conditions of the Contract as contained in form no IPR-FP-12 which is Section 'B' of this tender document. Tenderers must therefore take special care to go through these general conditions of contract and in exceptional cases if any deviations are proposed, these must be clearly indicated in the Part-I (Techno-commercial) of the tender as a separate annexure instead of merely enclosing their printed conditions of sale. Tenders made subject to counter conditions of far too many deviations from the general conditions of contract i.e. Section 'B' of this tender document are liable to be ignored. It should also be realized that failure to bring out deviations from the General Conditions of Contract contained in Section 'B' of this tender document will imply that the tenderer is willing to execute the contract as per the Purchaser's terms and conditions of contract.

1.8 PRICE

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

1.8.2 Prices quoted shall be in the currency of the country of origin and the offers linking the quoted currency with some other currency are liable to be ignored.

1.8.3 Prices quoted must be on the following basis:

1.8.3.1 F.O.B. / F. C. A. Port of Shipment (i.e. Free on Board the Vessel at the nearest Port of Shipment – packing, inland freight, charges towards loading the consignments on the vessel, documentation etc. included) Name of the Port (Sea/Air) proposed for shipment shall be clearly indicated.

1.9 SPARES AND ACCESSORIES

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

1.9.1.1 For a period of two years and

Bidders are advised to suggest appropriate spares including consumables and replacement parts with maintenance plans for 4000 hours of operation per year. These prices shall be quoted on unit price basis. Bidders shall offer an optional cost for spare turbine kit also.

1.9.1.2 For a period of five years.

Bidders shall give offer for the 5-year operation spares kit (including major maintenance kit). These prices shall be quoted on unit price basis. Bidders are advised to suggest appropriate spares including consumables and replacement parts with maintenance plans for 4000 hours of operation per year.

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

1.10 QUANTITY

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

1.11 AUTHORITY OF AGENTS

- 1.11.1 In case where a tender is submitted by an Indian Agent on behalf of his foreign principal, such tender should be supported with a 'Letter of Authority' from such Principal that the Indian Agent has been authorized to submit the tender on behalf of the principal. Tenders not accompanied by such a Letter of Authority are liable to be ignored. However, acceptance of offer will be communicated only to the foreign principals directly. The Foreign Principal shall ensure that he submits offer only through one single Indian Agent.

1.12 AGENCY COMMISSION

- 1.12.1 Commission payable to the Tenderer's Agents in India, if any, shall be included in the price. Name and address of the Agents and the percentage of commission payable to them and included in the price shall be clearly indicated. The commission will be paid directly to the Indian Agents in equivalent Indian Currency. The Foreign Principal shall ensure that he submits offers only through one single Indian Agents.

1.13 STATUS OF INDIVIDUAL SIGNING THE OFFER

- 1.13.1 Individuals signing the tender form and other connected documents must specify the capacity in which they sign, like,

- 1.13.1.1 Whether signing as a 'sole Proprietor' of the firm or his attorney.

- 1.13.1.2 Whether signing as a 'Partner' of the firm or his attorney.

- 1.13.1.3 Whether signing for the firm 'As Agent'

1.14 TRAINING

Bidder shall provide three day training to all cryogenic personal at purchaser's site. In addition, bidder shall provide practical training on all stages of installation, commissioning, start-up, cool-down and acceptance testing of the refrigeration plant. Bidder shall prepare a troubleshooting list and explain the procedures for trouble shooting step by step. The content of training shall be process operation, servicing and maintenance, safe operation description, emergency shutdown process, start-up process as well as explanation on operation manual, maintenance manual and troubleshooting procedures.

Training documents and language of the training shall be in English.

1.14.1 The contractor shall, in special cases, if required by IPR, provide facilities for the practical training of the Purchaser's engineers and technical personnel from India and for their active employment process of plant/machinery/equipment/instrument through the manufacturing period of the contract/stores. Such training would normally be required only in case of special plant/machinery/equipment/instrument and particularly manufactured equipment. In such an event, the Purchaser shall bear travelling and billeting expenses of the trainees and the contractor will be required only to bear the cost of the training proper. Wherever, himself would recommend such training, he should furnish the cost of such training and indicates clearly the number of trainees and the duration of the training that he would recommend.

1.15 SUBMISSION OF DRAWINGS

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

1.16 SUB-CONTRACTING/SUBLETTING

1.16.1 The tenderer in the event of his tender 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 which consent shall not be unreasonably withheld, but the tenderer 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. 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 a 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.

1.17 SHOP / FACTORY EVALUATION, QUALITY SURVEILLANCE/ INSPECTION AND SUBMISSION OF PROGRESS REPORTS.

1.17.1 The Purchaser or his technical authorities may at his option and prior evaluation of the tender depute his inspector or any quality surveillance of his choice to the factory/workshop of the

tenderer to assess and establish the manufacturing Capability etc., of the tenderer. Similarly, the Purchaser may also depute his Inspector/Quality Surveillance agency of his choice for inspection of the plant/machinery/equipment/component during the various stages of manufacture. In such an event the tenderer/contractor shall

- 1.17.1.1 Allow reasonable facility and free access to his factory/works/records to the Inspector for the purpose of inspection or for ascertaining the progress of manufacture and delivery.
- 1.17.1.2 Provide the drawings, tooling, gauges, instruments etc. required for carrying out the inspection work.
- 1.17.1.3 Produce an inspection plan to the Purchaser's satisfaction notifying him when checkpoints on the plan are imminent.
- 1.17.1.4 Not supply or deliver the plant/equipment/machinery/component unless and until a Shipping Release or an authorization for despatch is obtained in a format provided by the Purchaser. Failure to comply with this instruction will not only result in withholding of the payment to the contractor/supplier but also hold the tenderer/contractor liable for payment of compensation to the Purchaser due to delay in clearance of the equipment/plant/machinery/ component from the carriers.

1.18 ERECTION AND COMMISSIONING

- 1.18.1 Tenderers must clearly and separately furnish in their offers the terms of supervision of erection and commissioning particularly in respect of plant/machinery/equipment.

1.19 INSTRUCTION MANUAL

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

1.20 PACKING

- 1.20.1 Tenderers shall note that packing for shipment shall be in accordance with the instructions outlined in this tender document and each package shall be limited to the size and weights that are permissible under the existing Air and Sea limitations. Even when no packing specification is included in the invitation to tender, it will be Supplier's responsibility to provide appropriate packing depending upon the nature of the supply and the transportation and handling hazards.
- 1.20.2 The equipment shall be so packed and protected as not to suffer deterioration damage or breakage during shipment and storage in a tropical climate.

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

1.21 MODE OF SUBMISSION OF TENDERS

1.21.1 All tenders in response to this invitation to tender should be submitted in a manner and method specified at clause Nos. 1.2 to 1.2.4. Late and delayed tenders WILL NOT (REPEAT) NOT at all be considered and therefore, it is in the interest of the tenderers to ensure that the tenders reach to Purchase Officer, IPR on or before the last date and time stipulated for receipt of tenders.

1.21.2 If any deviation or substitution from the technical specifications contained in Section "C" to this tender document is involved, such details should be clearly indicated in Part – I (Techno-Commercial) and should be added as an annexure to Part-I (Techno-Commercial) of the tender as otherwise it shall be an admission on the part of the tenderer that he will supply the equipment as specified by the Purchaser. Part-I (Techno-Commercial) should be submitted in accordance with the format provided by the Purchaser at Section "D" of this tender document.

1.21.3 Part-II (Price alone) and other related commercial terms and conditions of contract should be furnished in accordance with the format provided by the Purchaser at Section "E" of this tender document.

1.22 DELIVERY

The delivery time shall be 14 months FOB seaport from the date of signing the contract. 5 months for shipment, installation, commissioning and final acceptance test at purchaser's site. Total project duration shall be 19 months from the date of signing the contract.

1.22.1 Tenderers should note that no tender will be considered by the purchaser unless the tenderer can meet the delivery schedule specified by the purchaser. All equipments/machinery/plant/component covered by this tender document should be supplied on or before..... or month from the date of approval of drawing.

1.23 ACCEPTANCE OF TENDERS

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

1.24 RESULT OF THE TENDERS

1.24.1 Unsuccessful tenderers will not be informed of the result of their tenders.

ADDITIONAL INSTRUCTIONS TO TENDERERS TO BE INCORPORATED IN THE
EXISTING INSTRUCTIONS TO TENDERERS AND TENDERING CONDIIIONS.

1. Payment Terms:

The purchaser's standard payment terms as specified in Form No. IPR-FP-14 & IPR-FP-12, (i, e. the General Conditions of all Contracts and Special conditions of Contracts governing supplies of Plant and Machinery) are full payment after receipt and acceptance of the stores by the purchaser.

In case any of the tenderers seeking advance or progressive payment prior to delivery of the material, such requests can be considered only in exceptional cases of large value items, in which case, the tenderer will be required to furnish a Bank Guarantee for an equivalent amount of the advance/progressive payment sought for, valid till the execution of the contract. The Bank Guarantee shall be got executed as per the purchaser's format from any of the nationalized/scheduled Bank.

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

In case any of the tenderers quote pro-rata payment for the stores to be supplied, they should clearly mention in their offer the maximum number of instalments of supply. However, such instalment delivery and pro-rata payment will be considered only in respect of contracts involving large value and sizeable quantity of items, and the maximum number of instalments shall be normally restricted to four (4).

2. Interest for delay in supply beyond the contractual delivery date:

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

3. Installation and commissioning

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

b) In respect of contracts involving installation and commissioning by the overseas supplier where identifiable charges for the same has been quoted by the tenderer, he shall bear the Income-tax liability as per the rates prevailing at the time of undertaking the job in accordance with the Income-tax Act in force in India, which at present is 20% on the installation and commissioning charges.

4. Performance Bond Bank Guarantee:

In the event of acceptance of the offer in respect of plant, machinery, equipment, instrument etc., the tenderer will be required to submit a Performance Bond Bank Guarantee for 10% of the value of the contract from a nationalized/scheduled bank on a non-judicial Stamp Paper of appropriate value, valid till the warranty period as per the purchaser's format, towards satisfactory performance of the plant, machinery, equipment, instrument etc. during the warranty period. In case of non-submission of the performance bond Bank Guarantee by the contractor; an amount equivalent to 10% of the total value of the contract will be retained till the expiry of the warranty period of the stores. The offers of the tenderers, who are not agreeable to furnish a Performance Bond Bank Guarantee or retaining of the 10% of the order value till the warranty period, are likely to be rejected.

5. Excise Duty:

IPR is also exempted from payment of Excise Duty under Notification No. 10/97-CE (Central Excise) dated 01-03-1997. Indian manufacturers should specify the applicable taxes and duties separately in the offer.

6. Custom duty:

IPR is exempted from payment of Customs Duty under Notification No.51/96-CUSTOM dated 23-7-1996 (GE21A) as amended by Notification No.93/96-CUSTOM dated 11-12-1996 (GE21A). Necessary Custom Duty Exemption Certificate, wherever applicable, and as per rules will be issued at the appropriate time.

7. TDS/Work Contract Tax/OR any other leviable taxes or duties:

- (i) Tax Deduction at Source (TDS): Applicable Income Tax will be deducted at source. In the case of Indian Bidders, applicable rate will be as per Section 194 of Income tax Act, 1961. In case of Overseas bidders it will be governed by Section 195 of Income Tax Act 1961 and Double Taxation Avoidance Agreement (DTAA) with the bidders Country.
- (ii) Work Contract Tax (WCT): Applicable WCT will be deducted at source as per Section 59 B of Gujarat Value Added Tax Act, 2005. Contracts having value less than Rs. 1 Crore are exempted.
- (iii) Any other leviable taxes or duties: If applicable, the same shall be recovered from the contractor/s bill and necessary certificate will be issued to the contractor.

8. Offers from Indian Agents on behalf of foreign suppliers:

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

- a) Photocopy of the Agency Agreement between the Principals and the Indian Agents showing the percentage or the quantum of agency commission payable and a Letter of Authority from the Principals authorizing the Indian Agents to submit the tender on their behalf.
- b) Copy of Registration Certificate with DGS&D.
- c) The type and nature of after sales services to be rendered by the Indian Agent.

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

9. Security Deposit Bank Guarantee:

In the event of acceptance of an offer, the tenderer will be required to submit a security deposit for 10% of the value of the order only in the form of Bank Guarantee valid till the satisfactory fulfilment of the entire contractual obligations, to be executed by a nationalized/scheduled Bank, on the requisite Non-judicial Stamp Paper, as per the purchaser's format.

EXEMPTION FROM PAYMENT OF SECURITY DEPOSIT FOR INDIAN MANUFACTURERS SUBMITTING THEIR OFFER IN INR.

In case the tenderer registered with DGS&D, NSIC or MSME, they can be considered for exemption from Security Deposit to the extent of the monetary limit of such registration, provided the past performance of the Contractor is satisfactory. Bidder should submit latest and valid registration certificate issued by DGS&D, NSIC or MSME along with the Technical Bid (PART-I). In respect of contracts beyond the monetary limits of such registration, the Contractor shall furnish a Bank Guarantee of the excess value, towards security deposit.

10. Conditional Discount:

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

11. Past Performance:

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

12. Capacity & Financial Standing:

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

13. EXPORT LICENCE / EXPORT PERMISSION:

It is entirely the responsibility of the suppliers who are quoting for materials of foreign origin to ensure obtaining export permission/licence/authorisation as required from the respective Government before arranging shipment. This Department would not accept post supply inspection by any agency/authority of any foreign country. It is, therefore, necessary that the vendors offering materials from foreign countries shall have thorough knowledge of export contract regulations in vogue in those countries. The vendors shall indemnify the purchaser against any consequences in respect of any end-use declaration they/their overseas Principals may furnish to the

government/government agencies of the country of origin of the materials, while seeking export permission/licence. Post supply inspection, contrary to the terms and conditions of purchaser's contract shall be deemed to be null and void. This Department reserves the right to reject any offer, which is not in conformity with the above instructions.

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

END USER STATEMENT:

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

14. Country of Origin:

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

15. Confidentiality:

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 Contractor, and should not be disclosed or passed on to any other person/firm without the prior written consent of the Purchaser. This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by the contractor.

16. Compliance with the Security Requirements of the Purchaser:

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

17. Rates to be Quoted in Figures & Words:

The tenderers shall ensure that the rates quoted by them are given both in figures and words failing which the tenders are liable to be rejected.

18. Permanent Account Number (PAN) :

Tenderers are required to submit a true copy of the PAN Card/Letter and copy of the factory Registration/Licence or shop establishment certificate as applicable with the quotation, failing which the tenders are liable to be rejected.

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

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

1. **RISKS TO BE COVERED:** Any loss or damage to the Purchaser's materials due to fire, theft, riot, burglary, strike, civil commotion, terrorist act, natural calamities etc. and any loss or damage arising out of any other causes such as other materials falling on purchaser's materials.

2. **INSURED BY:** (Name of the Contractor)

3. **BENEFICIARY:** Institute for Plasma Research
Nr. Indira Bridge
Bhat, Gandhinagar-382428
Gujarat
INDIA

4. **AMOUNT FOR WHICH INSURANCE POLICY TO BE FURNISHED** The amount will be indicated in the respective Contract.

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

Notwithstanding the insurance cover taken out by the Contractor as above, the Contractor shall indemnify the Purchaser and keep the Purchaser indemnified to the extent of the value of free issue materials to be issued till such time the entire contract is executed and proper account for the free issue materials is rendered and the left over/surplus and scrap items are returned to the Purchaser. The contractor shall not utilize the Purchaser's free issue materials for any job other than the one contracted out in this case and also not indulge in any act, commission or negligence which will cause/result in any loss/damage to the Purchaser and in which case, the Contractor shall be liable to the Purchaser to pay compensation to the full extent of damage/loss. The Contractor, shall be responsible for the safety of the free issue materials after these are received by them and all through the period during which the materials remain in their possession/control/custody. The free issue materials on receipt at the Contractor's works shall be inspected by them for ensuring safe and correct receipt of the material. The Contractor shall report the discrepancies, if any, to the Purchaser within 5 days from the date of receipt of the material. The Contractor shall take all necessary precautions against any loss, deterioration, damage or destruction of the FIMs from whatever cause arising whilst the said materials remain in their possession/custody or control. The free issue

materials shall be inspected periodically at regular intervals by the Contractor for ensuring safe preservation and storage. The Contractor, shall also not mix up the materials in question with any other goods and shall render true and proper account of the materials actually used and return balance remaining unused material on hand and scrap along with the final product and if it is not possible within a period of one month from the date of delivery of the final product covered by this purchase order. The Contractor, shall also indemnify the Purchaser to compensate the difference in cost between the actual cost of the free issue material lost/damaged and the claim settled to the Purchaser by the insurance company. The decision of the Director, IPR, as to whether the Contractor has caused any loss, destruction, damage or deterioration of the free issue materials while in his possession, custody or control from whatever cause arising and also on the quantum of damage suffered by the government, shall be final and binding upon the Contractor

20. This is a TWO PART Tender. Bidder should submit the bid in Two Parts,
 - (i) **PART – I:** Technical Bid & Commercial Terms and Conditions **Except price.**
 - (ii) **PART – II:** Price Bid (**Price Alone**)Bidders shall submit the bid in duplicate.
21. **PRICE BID FORMAT:** Bidder shall quote price on the Price Bid Format given in Section-E of tender documents.
22. Full details and specifications of the items and general instructions to be followed regarding submission of tenders are indicated in the tender documents.
23. **Proof for fulfillment of eligibility criteria mentioned above should be submitted along with the tender. If the tender is submitted without valid documents, Purchaser shall not consider your offer. Tenders received without proof of eligibility criteria will be rejected.**
24. While requesting for Tender Documents, such request shall indicate the **“REQUEST FOR TENDER DOCUMENTS AGAINST TENDER NOTICE NO. IPR/TPT/TN/PUR/F/16-17/8 DATED 03-08-2016.”**
25. **Tender Fee: The tender fee (non-refundable) of USD 15.00 (US Dollar Fifteen only) OR EURO 14.00 (EURO Fourteen only) OR Indian Rs. 1000.00 (Indian Rupees One Thousand only) should be made in the form of DEMAND DRAFT drawn in favour of Institute for Plasma Research and payable at Ahmedabad, Gujarat (India). Vendor’s name and tender number shall be indicated on the reverse side of the Demand Draft.**
26. **DD should not be prior dated to the date of advertisement. Separate request letter and separate Demand Draft shall be sent for each tender.**
27. **Those who use the downloaded tender documents from IPR Website may submit the prescribed Tender Fee keeping in a separate envelope along with the tender. This envelope should be marked as “TENDER FEE”.**
28. No request for the extension of due date will be considered.
29. Late/Delayed offers will not be accepted.
30. **Earnest Money Deposit:** Bid must be submitted along with Earnest Money Deposit (EMD) for USD 7463.00 (US Dollars Seven Thousand Four Hundred Sixty Three only) OR EURO 6627.00 (EURO Six Thousand Six Hundred Twenty Seven only) OR Indian Rs. 5,00,000.00 (Rupees Five Lacs only) by way of Demand Draft drawn in favour of **Institute for Plasma Research** payable at

Ahmedabad, Gujarat, INDIA. EMD of unsuccessful bidder(s) will be returned after finalization of the contract.

Exemption from payment of EMD: The firms registered with DGS&D, NSIC and registered MSME's are exempted from payment of EMD subject to submission of valid registration certificate. In the case of foreign bidders, payment of EMD is exempted if they submit their bid directly or through their Indian agent in Foreign Currency, so that the order can be placed directly on their Principals.

The EMD shall be forfeited in case the Bidder fails to comply with any of the terms and conditions stipulated in the tender documents, after submission of Bid.

30.1 The Tender Fee/EMD in case of INR shall be from State Bank of India (SBI)/any Nationalized Bank or any one of the Banks mentioned in bracket (ICICI, IDBI, HDFC, AXIS)

30.1.1 In case the Tender Fee/EMD is from any foreign Bank, it should be from a first class bank of international repute.

31. **Due date to submission of Tender: Tender in a sealed envelope (Part-I, Tender Fee & EMD in one envelope and Part-II in another envelope) superscribing the envelope with the above tender no., date, due date and brief description of tendered item should be submitted by 13.00 Hrs. I. S. T. on 21st September, 2016 to the Purchase Officer, IPR at the following address**

Purchase Officer
Institute for Plasma Research
Near Indira Bridge, Bhat
Gandhinagar – 382428.
Gujarat, INDIA.

Part – I (Techno-Commercial Bid: - Except Price) will be opened on the same day at 14:30 Hrs. I.S.T. in the presence of attending tenderers.

Part – II (Price Bid) : Date of opening of Price Bid of eligible Bidder/s will be intimated to them later on.

32. The representative who attends the tender opening should carry an authorization letter from the organization for participation in the tender opening failing which he/she may not be allowed to participate in the tender opening. However one representative only will be allowed to participate in the tender opening process.
33. **The tenderers representative, who reaches the venue of tender opening late, i.e. after the starting time specified for opening of the tenders, may not be allowed to take part in the tender opening.**
34. In the event of any date indicated above is declared as a Holiday, the next working day shall become operative for the respective purpose mentioned herein.
35. IPR will not be responsible for any delay/loss of Tender or documents in transit.
36. Bidders should furnish/enclose full technical details/literature, delivery period and confirm the terms and conditions attached with the tender.
37. **Bids received without the prescribed Tender Fee and EMD will not be considered.**
38. Bidder will submit technical bid, commercial bid and all supporting documents pertaining to this tender in English.
39. **Specifications:** Technical Specifications & drawings are given in Section-C.
40. **Rejection of bid:**

Non-compliance of tender specifications and/or tender documents including terms and conditions will lead to rejection of quotations received.

41. All communications related to this tender must be sent to,

Purchase officer,
Institute for Plasma Research
Near Indira Bridge, Bhat
Gandhinagar – 382428.
Gujarat, INDIA.
Phone: 079 23962022
Fax : 079 23962277
E-mail: bkbsrao@ipr.res.in/alpesh@ipr.res.in/pinto@ipr.res.in

NOTE: Issue of tender documents does not mean that a Bidder is qualified to submit bids. IPR's decision to consider as to whether a bidder has met with the eligibility criteria is final.

GENERAL CONDITIONS OF CONTRACT

Form No IPR-FP-12

GENERAL CONDITIONS OF CONTRACT
APPLICABLE TO PURCHASE ORDER / CONTRACTS FOR IMPORTED STORES
PLACED BY THE INSTITUTE FOR PLASMA RESEARCH

SECTION – 1

1. PEAMBLE

- 1.1 While the conditions contained in Portion I will apply to all contracts. Portion II will also apply to contracts for Plant/Machinery/Equipment/Instrument.

2.0 GENERAL CONDITIONS OF CONTRACT

2.1 DEFINITIONS AND INTERPRETATION

- 2.1.1 In the contract and the general and special conditions governing it, unless the context otherwise requires
- 2.1.2 “PURCHASER” means the shall mean the Institute for Plasma Research, acting through the Director or his authorized representative [herein after called as “IPR”]
- 2.1.3 “DIRECTOR”, means the Director of IPR, for the time being in the administrative charge of the Director, IPR and includes the Senior Purchase Officer, Purchase Officer or Assistant Purchase officer or any other officer authorized for the time being to execute contracts relating to the purchase and supplies of stores on behalf of the Purchaser.
- 2.1.4 “CONTRACTOR” or “SUPPLIER” means the individual firm or company with whom or with which the contract/purchase order for supply of Stores is placed and shall be deemed to include his successors, heirs, executors, administrators and permitted assignees, as the case may be.
- 2.1.5 “CONTRACT” or “PURCHASE ORDER” means and comprises of a Letter or *Cable or *Telex or *Fax(*followed by a written confirmation) conveying acceptance of Contractor’s offer and invitation to tender, tender containing offer, advance acceptance of the offer, acceptance of offer, general and special conditions of contract specified in the acceptance of offer and any subsequent amendments/alterations thereto made on the basis of mutual agreement.
- 2.1.6 “STORES” OR “MATERIAL” means the goods specified in the contract/purchase order which the contractor has agreed to supply under the contract.

- 2.1.7 "SUB-CONTRACTOR" or "SUB-SUPPLIER" means any contractor or supplier engaged by the contractor or the supplier with the prior approval of the Purchaser in relation to the contract/purchase order.
- 2.1.8 "INSPECTOR" or "QUALITY SURVEYOR" means any Engineer nominated and deputed by the purchaser or their appointed Consultants or quality Surveillance Agency or any other person from time to time authorized by the Purchaser to act as his representative for the purpose of inspection of stores under the contract/purchase order.
- 2.1.9 PARTIES
- 2.1.9.1 The parties to the contract are the Contractor and the Purchaser and the Purchaser named in the Contract/Purchase Order.
- 2.2 AUTHORITY OF PERSON SIGNING THE CONTRACT ON BEHALF OF THE CONTRACTOR
- 2.2.1 The person signing the contract or the purchase order or any other document in respect of the contract or purchase order on behalf of the contractor shall deemed to warrant that he has the authority to bind the contractor
- 2.3 SUB-CONTRACTING
- 2.3.1 The contractor/supplier shall not assign, sublet or delegate the contract or any part thereof without the Purchaser's prior written consent, which consent shall not be unreasonably withheld, but he may without the Purchaser's consent purchase such parts, accessories or associated equipment as he does not normally manufacture.
- 2.4 DRAWINGS AND SPECIFICATIONS
- 2.4.1 The drawings and specifications are intended to be complementary and to provide for and comprise everything necessary for the completion of supply. Any material shown on the drawing even if not particularly described in specifications or vice versa is to be supplied by the Contractor as if it were both shown and specified.
- 2.4.2 Should any discrepancy be noted in the drawings and/or specifications and should any interpretation of the same be required, the matter shall be referred to the Purchaser for clarification which shall be binding upon the contractor. Otherwise, the contractor shall assume responsibility for the interpretation of the drawings and specifications including interpretation by his sub-contractors.
- 2.4.3 Should any difference or dispute arise with regard to the true intent and meaning of drawings or specification or should any portion of the same be obscure or capable of more than one interpretation, the same shall be decided by the Purchaser whose decision shall be final.
- 2.4.4 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.

2.4.5 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.

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

2.5 GENERAL WARRANTY

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

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

2.6 ALTERATIONS

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

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

2.7 PACKING

2.7.1 The contract shall pack the stores at his own cost sufficiently and properly for transit by sea/air 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.

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

2.8 INSPECTION

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

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

2.8.3 The supplier shall give notice of readiness for inspection to the Inspector (deputed under clause 2.8.2 above) so that the Inspector can be present at the requisite time. In such an event delivery shall not be effected until an authorization or shipping release is obtained from the Purchaser's Inspector.

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

2.9 MARKING

2.9.1 Each package delivered under the contract shall be marked by the contractor at his own expense on three sides of the package and such markings shall be distinct and shall clearly indicate the description and quantity of stores, name and address of the consignee, gross and net weight of the package, name of the contractor, ultimate destination, port of discharge etc.

The marking shall generally be as under

Name and address of the consignee	Purchase Officer, Institute for Plasma Research, Nr. Indira Bridge Bhat, Gandhinagar-382428 Gujarat, India.
Contract Number and Date	No. _____ Date _____
Brief Description of Goods	
Weight	
Dimension	
Ultimate Destination	
Port of Discharge	
Package Number	

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

2.9.3 The inspector, wherever deputed by Purchase under clause 2.8.2 may reject the stores of the stores are 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.

2.10 TIME FOR AND DATE OF DELIVERY – THE ESSENCE OF CONTRACT.

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

2.10.2 EXTENSION OF DELIVERY SCHEDULE / LIQUIDATED DAMAGES

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

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

2.10.2.2.1 recover from the contractors as agreed liquidated damages and not by way of penalty a sum equivalent to two percent of the price of any stores which the contractor has failed to deliver within the period fixed for delivery in the contract or such additional period as mentioned in para 2.10.2.1 for each month or part of the month during which the delivery of such stores, may be in arrears where delivery thereof is accepted after expiry of the aforesaid period. (For the purpose of computing the damages for delayed supplies under the clause, the cost of the entire plant/machinery/equipment/instrument will be taken into consideration if the plant/machinery/equipment/instrument cannot be put to the intended use for want of delayed portion of supply). OR

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

2.10.2.2.3 Cancel the contract or portion thereof and if so desired purchase or authorise purchase of the stores not so delivered or others of a similar description (where stores exactly complying with the contract specification are not in the opinion of the Director, IPR whose opinion shall be final, readily procurable) at the risk and cost of the contractor, if the

contractor had defaulted in the performance of the original contract, the purchaser shall have the right to ignore his offer in response to risk purchase enquiry even though the lowest.

2.10.3 Where action is taken under sub-clause 2.10.2.2.2 or sub-clause 2.10.2.2.3 above the contractor shall be liable for any loss which the purchaser may sustain on that account provided the purchaser or, if there is an agreement to purchase such agreement is made, in case of failure to deliver the stores within the period fixed for such delivery within six months from the date of such failure and in case of repudiation of the contract before the expiry of the aforesaid period of delivery, shall not be entitled to any gain on such purchase and the manner and method of such purchase shall be in the entire discretion of the Director, IPR. It shall not be necessary for the purchaser to serve a notice of such purchase on the contractor.

2.11 RECTIFICATION AND REPLACEMENT OF DEFECTIVE STORES

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

2.12 INSPECTOR'S AUTHORITY TO CERTIFY PERFORMANCE

2.12.1 The Inspector, where ever deputed by the Purchaser under Clause 2.8.2 shall have the power:

2.12.1.1 Before any stores or parts thereof submitted for inspection to certify that they cannot be in accordance with the contract owing to the adoption of any unsatisfactory method of manufacture.

2.12.1.2 Reject any stores submitted for inspection or part thereof as not being in accordance within the specification.

2.13 CONSEQUENCE OF REJECTION

2.13.1 If on the store being rejected by the inspector or consignee at the destination the contractor fails to make satisfactory supplies within the stipulated period of delivery, the Director, IPR may:

2.13.1.1 Allow the contractor to submit for inspection fresh stores in replacement of those rejected, within specified time, the contractor bearing the cost of freight on such replacement without being entitled to any extra payment on that account. OR

2.13.1.2 purchase or authorise the purchase of quantity of the stores rejected or others of similar description (where stores exactly complying with the contract specification are not in the opinion of the Director, IPR which opinion shall be final, readily available) without notice to the contractor at his risk and cost and without affecting the contractor's liability as regards further supply of stores due under the contract.

2.13.1.3 Cancel the contract and purchase or authorise the purchase of stores or others of a similar description (where stores exactly complying with the contract specification are not in the opinion of the Director, IPR which opinion shall be final, readily available) at the risk and cost of the contractor. In the event of action being taken under sub clause 2.13.1.2 above of this sub-clause, the provision of Clause 2.10.2 shall apply as far as applicable.

2.14 WARRANTY

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

2.14.2 Should any defect or deficiency in the stores supplied by the contractor under the contract appear to be discovered within 12 months from the date of receipt 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 cost to the Purchaser. If the contractor after such notification shall make default or delay in diligently rectifying all such defects, deficiencies or failure to the satisfaction of the Purchaser, the Purchaser may take recourse to the remedies provided for in clause 2.10.2.2.2 as applicable.

2.15 PERMIT AND LICENCES

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

2.16 PATENT INDEMNIFICATION

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

2.16.2 In the event of any claim being made or action being taken against the purchaser in respect of the matter referred to clause 2.16.1 above, the contractor shall promptly be notified

thereof and he shall at his own expense, conduct all negotiations for the settlement of the same and any litigation that may arise therefrom.

2.16.3 In the event of any designs, drawing, plans or diagrams or any manufacturing methods or process furnished by the contractor constituting infringement of patent or any other protected rights and use thereof is restrained, the contractor shall procure for Purchaser, at no cost to the letter, 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.

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

2.17 MODE AND TERMS OF PAYMENT

The Payment Schedule for the tender is given hereunder:

- *Through Wire Transfer:*

20% of the FOB value (excluding installation and commissioning charges) will be paid as advance against submission of Invoice along with Advance Bank Guarantee for an equivalent amount. This payment will be made only after signing of the contract and on submission of Security Deposit. A format for advance bank guarantee is attached herewith (refer appendix 'C').

- *Through Letter of Credit:*

70% of the FOB value (excluding installation and commissioning charges) will be paid against presentation of clear & unconditional shipping documents together with the shipment clearance letter issued by IPR to the negotiating Bank.

- *Through Wire Transfer:*

10% of the FOB value plus 100% installation and commissioning charges will be paid within 30 days after installation and commissioning and completion of satisfactory acceptance tests at IPR site and on submission of the Invoice with 10% Performance Bank guarantee of the contract value from a first class foreign bank/nationalized/scheduled bank, valid throughout the warranty period and the grace period of 2 months. A format for performance bank guarantee is attached herewith (refer appendix 'A').

2.17.1 Unless otherwise specified in the contract, 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 within fifteen days from the date of presentation of the following documents to the Purchaser's Bank specified in each contract:

- a. Negotiable Bill of Lading or Airway Bill as the case may be evidencing shipment
- b. Invoice for the shipment: Four Copies
- c. Packing List: Four copies
- d. Certificate of country of origin: Two copies
- e. Shipping release from Inspector or Quality Surveillance Agency nominated by the

- Purchaser for the purpose of inspection: Four copies
- f. Certificate of Quality including work test certificates of Chemical Analysis where applicable: Two copies
 - g. Shipping authorization from purchaser wherever required.
 - h. Bank Guarantee for the 10 percent of the value of contract in respect of plant/machinery/ Equipment/instrument towards performance bond as provided for in Clause 2.22.8 of Section II

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

2.17.2 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 Director, IPR, three copies of non-negotiable Bill of lading or Airway Bill as the case may be, along with a copy of the invoice and packing list. If the purchaser incurs any extra expenditure by way of penalty payable to the Port Trust authorities in India or any other such expenditure due to delay in receipt of shipping documents specified by him, the contractor shall be responsible for making good such extra expenditure incurred by the Purchaser.

2.17.3 BANK CHARGES

2.17.3.1 While the Purchaser shall bear the bank charges payable to his Bankers in India (State Bank of India, Ahmedabad) the Contractor shall bear all the bank charges payable outside India including the charges towards advising/amendments commission.

2.17.4 AGENCY COMMISSION

2.17.4.1 The amount of commission included in the price and payable to the Indian Agents of the Contractor shall be paid directly to the Indian Agents by the Purchaser in equivalent Indian Rupees 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 and the exchange rate will be the one based on which payment is made to the Contractor".

2.17.4.2 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 contractors invoice should separately reflect the amount of commission payable to his Indian Agent.

2.18 INSURANCE

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

2.19 WITH-HOLDING AND LIEN IN RESPECT OF SUMS CLAIMED

2.19.1 Whenever any claim or claims for payment of a sum of money arises out of or under the contract against the contractor, Purchaser shall be entitled to withhold and have a lien to retain to the extent of the such claimed amount, from any sum or sums found payable or which at any time thereafter may become payable to the contractor under the same contract or any other contract with the Purchaser or any person contracting through the Director, IPR pending finalisation of any such claims.

2.19.2 It is an agreed term of the contract that the sum of money or money so withheld or retained under the lien referred to above by the purchaser will be kept withheld or retained as such by the purchaser till the claim arising out of or under the contract is determined by the Arbitrator and that the contractor will have no claim for interest or damage whatsoever on any contract in respect of such with-holding or retention under the lien referred to supra and duly notified as such to the contractor.

2.20 LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

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

2.20.2 It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Purchaser will be kept withheld or retained as such by Purchaser till this claim arising out of in the same contract or any other contract is either mutually settled or determined by the arbitrator, and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money with-held or retained under this clause and duly notified as such to the contractor.

2.21 ARBITRATION

2.21.1 All disputes arising in connection with the present contract shall be finally settled under the Rules of Conciliation and Arbitration of the International Chamber of Commerce by one or more Arbitrators appointed in accordance with the said Rules.

PART II SECTION II

In addition to the General Conditions of Contract contained in Section I above the following Special conditions shall apply to contracts for supply of plant/machinery/equipment/manufactured equipment. These special conditions in Section I shall override the letter.

2.22 SPECIAL CONDITIONS OF CONTRACT

2.22.1 RESPONSIBILITY FOR COMPLETENESS

2.22.1.1 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 extra charge and the plant/machinery/equipment/instruments must be completed in all respect.

2.22.2 FINAL TEST

2.22.2.1 The final tests as to performance and guarantee shall commence within one month of completion of successful commissioning.

2.22.3 REJECTION OF DEFECTIVE PLANT

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

2.22.4 WARRANTY

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

2.22.4.2 If it becomes necessary for the Contractor to replace or renew any defective portions of the plant for purpose of rectification under this clause, the provisions of this clause shall apply to the portions of the plant so replaced or renewed under the expiration of six months from the date of such replacement or renewal or until the end of the above mentioned period of twelve months whichever may be the later. If any defects not rectified within reasonable time, the purchaser may proceed to get the work done at contractor's risk and expenses but

without prejudice to any other rights which the Purchaser may have against the Contractor in respect of such defects.

2.22.4.3 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.

2.22.5.1 All contractor shall under that before going out of production of the spare parts he will give adequate advance notice to the Purchaser so that the letter may order his requirement of spares in one lot if he so desires.

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

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

2.22.6 ERECTION AND COMMISSIONING

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

2.22.6.2 TIME FOR COMPLETION OF ERECTION

2.22.6.2.1 The time agreed for completion of erection and commissioning shall be the essence of the contract and should any delay or default occurs on the part of the Contractor, the Purchaser, shall have the right to make alternative arrangement to carry out erection and commissioning of the Plant / Machinery / Equipment / Instrument and the Contractor shall be liable to pay to extra expense that may be incurred by the Purchaser on this account.

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

2.22.7 TRAINING

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

2.22.8 SECURITY DEPOSIT AND PERFORMANCE BOND

2.22.8.1 The Contractor shall at the opinion of the Purchaser and within the period prescribed by him shall furnish Security Deposit not exceeding 10% of the contract value in the form of:

a) Bank Guarantee from the State Bank of India (as per Appendix 'B')

OR

b) Demand draft drawn in favour of IPR, on the State Bank of India, Ahmedabad.

If the contractor fails to provide Security Deposit as above within the stipulated time limit or within the extended time granted by the Purchaser shall constitute a breach of the contract and the Purchaser shall be entitled to make other arrangements for the repurchase of the Stores / Equipment contracted for at the risk and expense of the Contractor and or to recover from the Contractor damages arising from such cancellation. The Bank Guaranteeing Bank without any reference to Contractor.

In the event the supplier's failure to perform the Contract satisfactorily, Purchaser shall be at liberty to retain the Security Deposit either in full or in part as the circumstances may warrant.

2.22.8.2 PERFORMANCE BOND

The Contractor shall furnish a performance bond in the form of a bank guarantee as per the specimen at Appendix "A" to this section for an amount equal to ten percent of the total value of the contract valid till expiration of the warranty period as a security for the satisfactory performance of the plant/machinery/equipment/instrument supplied under the contract

APPENDIX 'A'
TO
PORTION II, SECTION B SPECIAL CONDITIONS OF CONTRACT
PERFORMANCE BOND
(TO BE EXECUTED BY THE CONTRACTOR'S BANK On non-judicial stamp paper of appropriate value)

Institute for Plasma Research
Nr. Indira Bridge
Bhat, Gandhinagar-382428
Gujarat
INDIA

WEHREAS on or about the _____ day of _____ 200____ M/s. _____ having its registered Office at _____ (hereinafter called 'The Contractor') entered into an Agreement No. _____ dated _____ for manufacture and supply of _____ hereinafter called 'The Contract') with the Director, IPR (hereinafter called 'The Purchaser')

AND WHEREAS under the terms and conditions of the contract final payment amounting to --under the contract is to be made against a performance bond in the form of bank guarantee furnished by the Contactor for a sum _____ of equivalent to 10% (Ten per cent) of the value of the contract towards satisfactory performance of the _____ (hereinafter called the equipment) valid for a period of 12 months from the date of putting into operation of the said equipment or _____ months from the date of receipt of the last lot of consignment whichever is earlier.

NOW We, (bank) inconsideration of the promises and payment of the final/balance amount of _____ under the contract to the contractor hereby agree and undertake to pay on demand and without any demur to the Director, IPR of the contractor a sum not exceeding _____ against any loss or damage that may be suffered by the Purchaser by the reasons of any unsatisfactory performance of the said equipment.

AND we, _____ (Bank) hereby also agree that the decision of the said Director, IPR as to whether the said equipment is giving satisfactory performance or not and as to the amount of loss or damages suffered by the Purchaser on account of unsatisfactory performance of the said equipment shall be final and binding on us.

AND We (bank) hereby further agree that our liability hereunder shall not be discharged by virtue of any agreement between the Purchaser & the Contractor whether with or without knowledge and/or consent or by reason of the Purchaser showing any indulgence or forbearance to the contractor whether as to payment, time 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.

Our guarantee shall remain in force until _____ and unless a claim under the guarantee is lodged with us within six months from the date (i.e. _____), all rights of the Purchaser under the Guarantee shall be forfeited and we shall be relieved and discharged from all our liabilities hereunder.

Our liability under this guarantee shall not be affected by any change in our constitution or the constitution of the contractor.

(Stamp & Signature)
FOR AND ON BEHALF _____ (BANK)
DATED AT _____ THE _____ 200

APPENDIX 'B'

TO
PORTION II, SECTION B SPECIAL CONDITIONS OF CONTRACT
SECURITY DEPOSIT

(TO BE EXECUTED BY THE CONTRACTOR'S BANK - On non-judicial stamp paper of appropriate value)

THIS DEED OF GUARANTEE MADE AT ----- this ----- day of -----
between ----- having its registered office at -----
----- and one of its branches at ----- (herein called "the Bank"
which expression shall mean and include the said ----- and its successors and assigns)
of the one part AND IPR (INSTITUTE FOR PLASMA RESEARCH) Near Indira Bridge, Bhat, Gandhinagar-
382428, Gujarat, India (hereinafter called "the purchaser" which expression shall mean and include
the said INSTITUTE FOR PLASMA RESEARCH, GANDHINAGAR and its successors and assigns) of the
other part.

WHEREAS _____ (hereinafter called "the Contractor/Supplier") having its registered
office at _____ have entered into a Contract having order/ contract
value of Rs./USD/Euro _____ (Rupees/USD/Euro _____) with the
purchaser being _____ Purchase order/Contract No. _____ Dated _____ for _____ in accordance
with the terms, specifications and conditions contained therein.

AND WHEREAS under the terms of the aforesaid order/contract,
the contractor/Supplier is to furnish to the Purchaser a Bank guarantee for an amount of
Rs./USD/Euro _____ (Rupees/USD/Euro _____) being 10% of
the total value of the purchase order/contract by way of security for fulfilment of the Contractual
obligations on the part of the Contractor/Supplier thereunder.

AND WHEREAS the Contractor/Supplier has requested the Bank to guarantee the due payment of
the aforesaid amount by the contractor/supplier to the purchaser in case the contractor/supplier
fails to fulfil any of the aforesaid contractual obligations.

NOW THIS DEED WITNESSES AS FOLLOWS:

1. The Bank hereby agrees unequivocally and unconditionally to pay within 48 hours, on demand, in writing from the purchaser or any officer authorised by it in this behalf and without demur, any amount up to and not exceeding Rs./USD/Euro _____ (Rupees/USD/Euro _____) to the Purchaser on behalf of the Contractor /Supplier.
2. This guarantee is valid and binding upon the Bank till final acceptance of the ordered item/s by the Purchaser and fulfilment of all the contractual obligations to the satisfaction of the Purchaser and shall not be terminable or affected by notice of any change in this constitution of the Bank or of the firm of Contractor or on account of any reason whatsoever.
3. The liability of the Bank hereunder shall not be impaired or discharged by any extension of time or variations or alterations made or conceded or agreed within or without the knowledge or consent of the Bank or by or between the parties to the said Purchase order.
4. The liability of the Bank under this deed is restricted to the sum of Rs./USD/Euro _____ (Rupees/USD/Euro _____) and same shall remain in force till final acceptance of the ordered item/s covered in the Purchase order (two months beyond final acceptance date). In case any further extension of the present guarantee is required the same shall be granted on receiving instructions in writing there for from the contractor/supplier on whose behalf this guarantee is issued.

5. Unless proceeding for enforcing this guarantee is commenced against the Bank within two months from the expiry of the aforesaid period or such extended period or period as aforesaid all the rights of the Purchaser under this guarantee shall be extinguished and the Bank shall be relieved and discharged from all liabilities hereunder.
6. The neglect or forbearance of the Purchaser in enforcement of any of its rights under the aforesaid purchase order against the contractor/supplier shall in no way relieve the Bank of its liability under this deed.

In witness whereof, we the ___ have executed this. This the _____ day of _____ 20_____.

Witnesses: (1)
 (2)

APPENDIX 'C'

BANK GUARANTEE (ADVANCE PAYMENT)

(TO BE EXECUTED BY THE CONTRACTOR'S BANK - On non-judicial stamp paper of appropriate value)

BANK GUARANTEE NO. _____ DATE: _____

1. WHEREAS on or about the _____ day of _____ M/s _____, a company registered under the companies act and having its registered office at _____ (hereinafter referred to as "the Contractor/Supplier") entered into an Agreement/Contract/Purchase Order bearing No. _____ date _____ with IPR (INSTITUTE FOR PLASMA RESEARCH), Near Indira Bridge, Bhat, Gandhinagar 382 428, Gujarat, India (hereinafter referred to as "The Purchaser") for the supply of _____ (hereinafter referred to as "the Equipment").

2. AND WHEREAS under the terms and conditions of the contract an amount of Rs./USD/Euro _____ (Rupees/USD/Euro _____ only) representing _____ percent advance payment out of the contract value of Rs./USD/Euro _____ (Rupees/USD/Euro _____ only) is to be paid by the Purchaser.

3. AND WHEREAS IPR has agreed in pursuance of the said terms and conditions of the contract to make an advance payment of Rs. _____ (Rupees _____ only) to the contractor on the Contractor furnishing a Bank Guarantee in the manner herein contained.

4. NOW WE, _____ (Name and Address of the Bank) in consideration of the Purchaser having agreed to pay to the Contractor an advance payment of Rs./USD/Euro _____ (Rupees/USD/Euro _____ Only) do hereby agree and undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of a sum not exceeding the said sum of Rs./ USD/Euro _____ (Rupees/ USD/Euro _____ Only) against any damage or loss that may be suffered by the Purchaser by reason of non-fulfillment of any of the terms and conditions of the contract by the Contractor.

5. WE, _____ (Bank) do hereby undertake to pay the amount due and payable under this guarantee without any demur merely on a demand from 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 breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement/Contract/Purchase Order or by reason of the Contractor(s)'s failure to perform the said Agreement/Contract/Purchase Order. 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./USD/Euro _____ (Rupees/ USD/Euro _____ Only).

6. WE, _____ (Bank) undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present guarantee 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) shall have no claim against us.

7. AND WE, _____ (Bank) hereby further agree that the decision of the said Project Director, IPR as to whether the Contractor has committed breach of any such terms and conditions of the contract or not and as to amount of damage or loss assessed by the said Project Director as damage or loss suffered by the Purchaser/IPR on account of such breach would be final and binding on us.

8. 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/Contract/Purchase Order or to extend time of performance by the said Contractor(s) 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 Agreement/Contract/Purchase Order 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 the effect of relieving us.

9. THIS GUARANTEE will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

10. OUR GUARANTEE shall remain in force until _____ (two months beyond the contract completion date) and unless a claim under the guarantee is lodged on or before the above date, all rights of Purchaser under the guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

In witness whereof, we the _____ have executed this.

Dated the ____ day of _____ 20 ____.

For _____
(Indicate the name of bank with Postal address, Fax
Number & email address)

Witnesses: (1)

(2)

TECHNICAL SPECIFICATIONS OF STORES AND DRAWINGS.

**Process Design, Fabrication, Supply, Installation, Commissioning and Acceptance
Test of 900 W at 4.5 K Helium Refrigeration (HR) System for SST-1 Up gradation
(Technical Specification Documents)**

CONTENTS

1. Introduction
 2. Cooling Philosophy
 3. Technical Specifications of Helium Refrigeration
 4. Details of IPR site for the HR installation
 5. Site Information and Conditions
 6. Operational Requirements of Helium Refrigeration
 7. Functional Specification of Helium Refrigeration
 8. Vendor's Scope of Supply
 9. Progress Review Meetings (At Vendor Site and At Factory Site)
 10. Acceptance Criteria
 11. Delivery Schedule
 12. Purchaser's scope of supply
 13. Standards and Codes to be followed
 14. Eligibility Criteria for the Vendors
 15. List of Queries to the vendors
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- Annexure - 2

Preamble: Helium Refrigeration for SST-1 Up gradation

Under the SST-1 Upgradation activities, to make SST-1 device being a fully superconducting device by introducing the Central Solenoid (CS) coil manufactured from Nb₃Sn based superconductors. The CS coil is connected to power supply through a pair of MgB₂ based superconductor current leads. In addition to make all poloidal coils in a superconducting state, we require additional cold capacity at 4.5 K. The cold capacity of about 900 W @ 4.5 K (in pure refrigeration mode) is required to meet the requirement of CS and PF coils. This document presents cooling scheme, technical and functional requirements, scope of supply, installation, commissioning, testing and acceptance related details of new helium refrigeration system

1. Introduction

Steady state Superconducting Tokamak (SST-1) has 16 toroidal field (TF) and 9 poloidal field (PF) coils of NbTi superconductor. The 9 PF coils have non-uniform path lengths. A 1.3 kW @ 4.5 K helium refrigerator / liquefier system is in operation to cool TF, PF coils and support structure to 4.5 K.

- As a part of SST-1 up gradation activities, we are modifying the PF hydraulic distribution system into three group having uniform path lengths for better control. To cool the PF coils to superconducting state, additional cold capacity of 450 W @ 4.5 K is required.
- To make SST-1 fully superconducting, Nb₃Sn based superconducting central solenoid (CS) is planned. Superconducting CS cryogenic heat load is estimated based on physical sizing, distribution and MgB₂ based current lead operation. The CS coil along with a pair of current leads will demand cooling capacity of 275 W @ 4.5 K.
- In order to provide higher pressure head cooling at 2.7 bar (a) / 4.5 K, a bath HEX system within the sub-cooler Dewar has been envisaged. This will call for cryo budget of ~175 W @ 4.5 K for temperature stabilization purpose.
- IPR requires refrigeration capacity of 450 W (for PF SCMS) + 275 W (for CS SCMS) = 725 W at 4.5 K. IPR also needs the high pressure (2.7 bar (a)) cold helium with sub-cooled temperature of 4.5 K at the inlet of the PF and CS coils using HEX bath cooled in a sub-cooled Dewar (SBD). The requirement of cold capacity for sub-cool Dewar is estimated as ~ 175 W equivalent cooling power at 4.5 K for ~ 38 g/s two-phase flow at 4.5 K and 2.7 bar (a). Therefore, in total, there is a clear need of helium refrigeration plant of 725 + 175 W = 900 W @ 4.5 K.
- The subsequent section describes cooling schemes, proposed technical requirement of 900 W @ 4.5 K helium refrigeration (HR) system with operational requirement, scope of supply and acceptance criteria.

2. Cooling Philosophy

As a part of SST-1 up gradation activities, the cryo-distribution of PF system will be modified such that uniform path lengths of PF coils are grouped together with combination of more or less equal path lengths. These modifications will be made in existing integrated fluid distribution and control system (IFDCS) and it will be under IPR Scope of Work. These three groups of PF coils will be cooled with new helium refrigeration (HR) system. The PF coils require much higher pressure head of 2.7

equivalent cold flow taken as liquefaction load in calculation of plant capacity. For this purpose 1.5 g/s at 4.5 K, 2.7 bar (a) two-phase flow is considered to remove static and dynamic (transient) heat load of CS coils.

A sub-cool Dewar (SBD) with heat exchanger in bath is required to mitigate the longer path lengths with inlet of 2.7 bar (a), 4.5 K and mass flow rate of ~ 38 g/s. The plant outlet must offer stable 4.5 K after SBD. The design of sub-cool loop is vendor’s scope of supply.

3. Technical Specifications of Helium Refrigeration

Sr. No.	Technical parameter	IPR Specification
1.	Refrigeration power for PF & CS	900 W for sub-cool He at 4.5 K, 2.7 Bar (a)
2.	Desirable $W_{300K}/W_{4.5K}$ ratio	≤ 400
3.	Plant outlet parameters	4.5 K, 2.7 Bar (a), ~38 g/s
4.	Return temp of PF SCMS to Cold box LP line	< 6.0 K
5.	Required pressure head for two-phase He flow	≥ 1.45 bar across PF & CS
6.	Compressor discharge pressure	~ 14 bar (a)
7.	Compressor suction pressure	~ 1.05 bar (a)
8.	Type of compressor	Oil lubricated water-cooled helium screw compressor with variable frequency drive (VFD)
9.	Oil removal system + primary oil separator	Oil impurity at the outlet of oil removal system must be less than or equal to 10 ppb
10.	Cold box	LN ₂ Pre-cool Heat exchanger Dual 80 K charcoal adsorber beds with by-pass and automatic regeneration 20 K adsorber bed Plate-fin heat exchangers Turbo-expander devices Joule Thomson Valves Return port Sub-cool device (Dewar or heat exchanger)

		Vertical orientation
11.	Purity monitor	Analysers / detector for H ₂ O, N ₂ , Hydro-carbon (C _x H _y) and oil aerosols
12.	Mains electrical supply	3-phase, 415 V ± 15 % VAC, 50 ± 5 % Hz
13.	Electrical supply	1-phase + N, 230 ± 10 % VAC, 50 ± 3 % Hz
14.	UPS electrical supply	1-phase + N, 230 ± 1 % VAC, 50 ± 1 % Hz
15.	Cooling water	20 to 30 °C at 3 bar (g), allowed temperature rise is 10 to 15 °C
16.	Pneumatic Instrumentation Air supply	≥ 6 bar (g)

4. Details of IPR Site for the HR Installation

At present, 1.3 kW HRL (ALAT make) is operational with all utilities (electrical, water and pneumatic air) as well as pure helium medium pressure buffer tanks, recovery compressor with impure helium high pressure storage tanks and LN₂ distribution system at IPR site. Thus location of new HR plant is fixed to minimise the interfaces with these sub-systems. It is planned to install screw compressor skid, oil removal system at compressor hall and cold box at cryogenic hall. Figure – 2 and 3 shows the layout of compressor hall and cryogenic hall. The clear floor space is also indicated in table – 1. Vendors are requested to design the HR component with this space constraint. The helium piping (low pressure (LP) and high pressure (HP)) between oil removal systems at compressor hall to cold box at cryogenic hall is in the scope of IPR. IPR will install the low pressure (LP) and high pressure (HP) helium piping as per the vendor's specification. The layout of IPR site showing compressor hall and cryogenic hall is attached in annexure – 1.

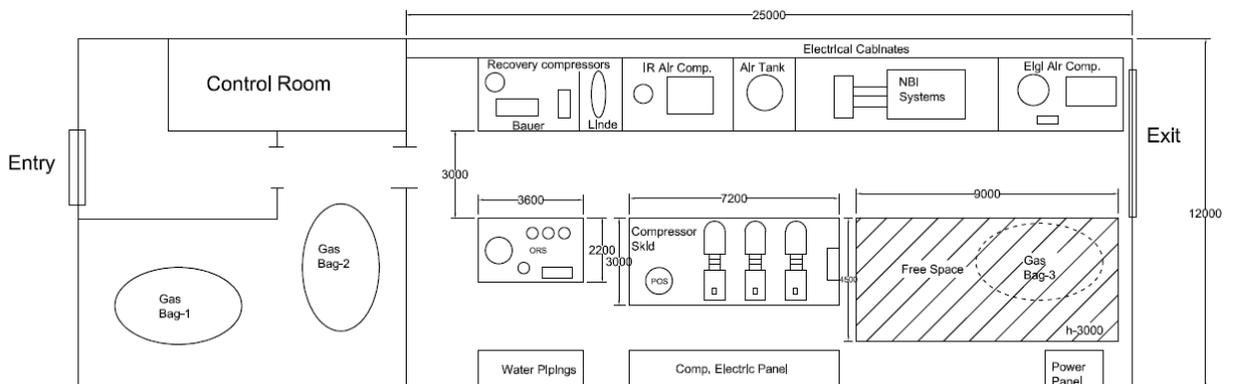


Figure – 2. Available space dimensions and layout drawing at IPR Compressor Hall

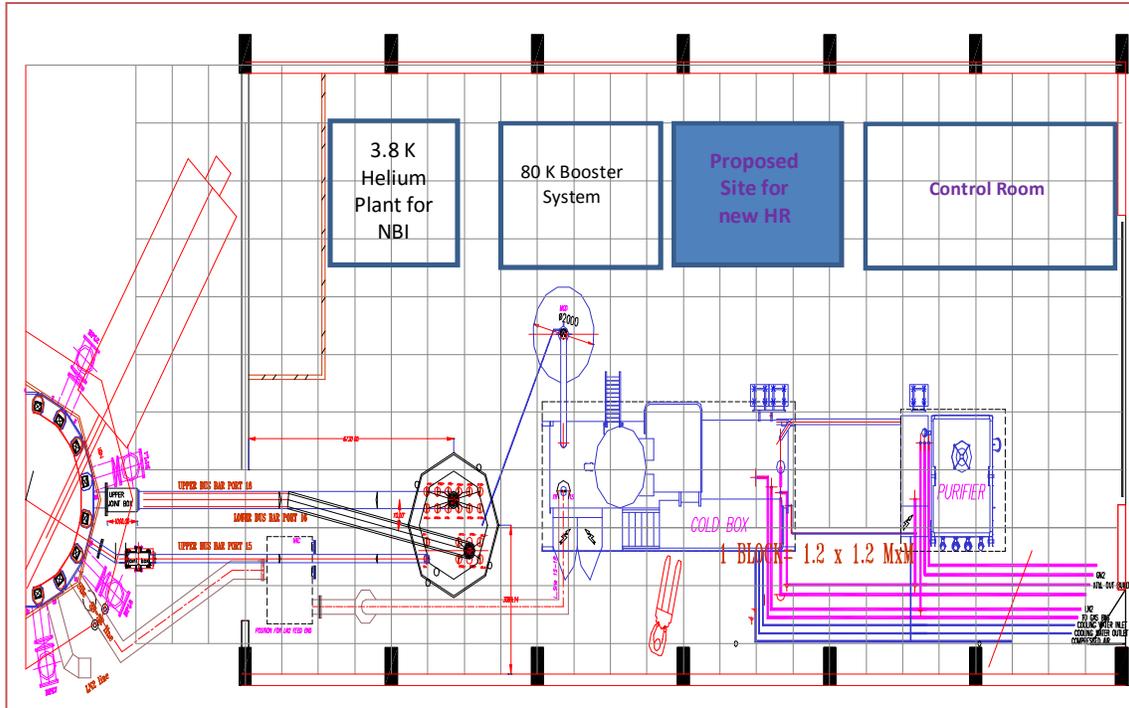


Figure – 3. Available space dimensions and layout drawing at IPR Cryogenic Hall

Table – 1. Available floor spaces at IPR site

Sr. No.	Location	Floor Space (L x W x H)
1.	Compressor Hall	9 m x 4.5 m x 3 m
2.	Cryogenic Hall	5 m x 3 m x 12 m
3.	Distance between Compressor Hall to Cryogenic Hall	~300 m

IPR will install piping between pure medium pressure buffer tanks to compressor stations of HR system as per vendor's specification. IPR also connects the outputs of all warm / cold safety & relief valves to the recovery system at compressor hall and cryogenic hall. IPR will provide all utilities (electrical, air and cooling water) as per the requirement of HR system. The detailed available utilities are mentioned in following sections. Vendors are requested to provide their utility requirement in advance for preparation at IPR site.

5. Site Information and Conditions

1	Purchaser	Institute for Plasma Research, Bhat Village, Near Indira Bridge, Gandhinagar - 382 428, Gujarat, INDIA.
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		Phone : (079)-23962000 / 2022-26 Fax : (079)-23962277
2	Site elevation (avg.)	55 meters above MSL
3	Ambient temperature	Max. (Annual): 48 °C Min. (annual): 4 °C Average (annual): 35 °C
4	Relative humidity	Max.: 90%; Min.: 17%
5	Rainfall	823 mm average (annual) June-August
6	Wind data	Max. Wind speed : 130 km/h Prevailing direction : SW to W Design wind pressure : 100 kgm ⁻²
7	Seismic data	0.04 g as per IS: 1893-1973; Seismic zone: IV
8	Accessibility By road: By rail: By sea: By air	Up to site (on Hansol-Gandhinagar H-way) Ahmedabad Rly. Stn. (12 km.) Bombay Harbour (525 km.) Ahmedabad Airport (6 km.)
9	Mains Input for screw compressor etc.	AC 415 ± 15 % v, 3 ~, 4 wire, PE, 50 ± 5 % Hz
10	Mains Input for vacuum pump, oil pump, heater etc.	AC 230 ± 10 % V, 1~, 2 wire, PE, 50 ± 3 % Hz
11	Aux for control scheme (UPS power supply)	AC 230 ± 1 % V, 1~, 2 wire, PE, 50 ± 1 % Hz

6. Operational Requirements of Helium Refrigeration

The helium refrigeration plant is required to perform the following tasks:

- Controlled cool down and warm up of the 9 PF superconducting coils and CS superconducting coils with MgB₂ based current leads.

- Maintain the required flow of sub-cooled helium to the PF and CS coils at specified pressure and temperature under various normal operational modes of the PF and CS coils.
- Handling the situations like quenching of PF and CS coils, emergency situations and recovery from the same as well as failure of plant due to either utility or component.

Following are the normal operational modes of PF and CS SCMS at 4.5 K:

- Standby mode in which PF and CS SCMS are maintained at 4.5 K without current
- Plasma production, which involves ramp-up, flat-top and ramp-down of current in CS SCMS as per requirement of plasma discharges and maintaining 4.5 K in PF and CS SCMS.
- Plasma shaping, which involves ramp-up of current in PF coils followed by maintenance of the current at design value for 1000 s and subsequent ramp-down of the PF current.
- The process of current operation of CS and PF occurs in long pulses of 1000 s duration. Sometime only 50 nos. of CS operation occurs in full day. In some of these pulses, the plasma may terminate with vertical displacement event (VDE) and/or plasma current disruptions.

The PF and CS SCMS are subjected to steady heat loads while at 4.5 K. In addition there will be transient loads occurring during operational modes. The transient heat loads are required to be absorbed in a suitable sub-cooler Dewar (SBD)/ buffer Dewar forming part of the plant.

The CS current lead cooling is done by new HR system. While the PF current lead cooling and operation is provided by existing 1.3 kW HRL system. The 1.3 kW HRL system has main control Dewar, which supplies LHe to 9 pair of PF current leads at 1.3 bar (a). The return of PF CL is fed back to suction of existing compressor station at room temperature.

The helium refrigeration plant should have the following features to satisfy the requirements of the application.

6.1 Capacity

The HR plant should provide 900 W refrigeration at 4.5 K 2.7 bar (a) with liquid nitrogen precooling. The total refrigeration capacity of the plant should be variable from 50-100% with the help of variable frequency drive. It should be also possible to operate the plant without LN₂ precooling at the reduced capacity. The cooling of PF and CS coils is provided with sub-cooled two-phase helium with flow rate of ~ 38 g/s at pressure at least 2.7 bar (a). The required refrigeration for production of sub-cool helium is included in total plant capacity.

6.2 Controlled Cool Down Mode

This mode defines controlled cool down of PF and CS cold mass for following situations.

- Controlled initial cool-down (from the ambient temperature) of the PF and CS with CS-CL along with the plant to 4.5 K.
- Controlled cool-down of part or whole PF and CS with CS-CL from elevated temperature (~100 – 120 K) to 4.5 K following a quench.

The PF and CS coils cool-down will be achieved such that difference between HR outlet temperature and maximum temperatures of coils must not exceed 50K to avoid the thermal stress among coils. Automatic operation of cool down mode is essential.

6.3 Controlled Warm Up Mode

This mode defines controlled warm up of PF and CS cold mass from 4.5K to 300K for following situations.

- Controlled warm-up from 4.5 K to ambient temperature of the PF and CS with CS-CL along with the plant.
- Controlled warm-up of part or whole PF and CS with CS-CL from elevated temperature to 300 K following a quench or emergency situations.

The refrigerator will warm up the PF and CS coils such that difference between HR out let temperature and minimum temperatures of coils must not exceed 50 K to avoid the thermal stress among coils. Automatic operation of warm up mode is essential.

6.4 Normal Two – Phase Steady State Operation Mode

This mode defines normal two-phase operation of PF and CS with sub-cool helium at 4.5 K, 2.7 bar (a) for current charging of PF and CS for plasma operations. In this mode the HR plant maintains steady state cooling during ramp-up, flat-top and ramp-down current operation of various PF and CS coils. HR control system must take action on any occurrences of process safety interlock, utility failure (like water, air, electricity, liquid nitrogen etc.) or any component level failure such that entire cold loop should come in safe status. All HR components as well as PF and CS coils massive cold mass should not get pressurised at any time of during above mentioned failure events.

6.5 Emergency Operations including Quench Handling

The HR plant should be equipped with proper relief, safety valves and controls to take care of following emergency situations:

- In case of quench in SCMS, the cold box needs to be isolated and the helium from SCMS diverted to the recovery system through existing IFDCS system as well as helium from cold box diverted to the recovery system through proper safety valves.
- In case of power failure or off-normal condition for long duration the helium should be diverted to the recovery system.

Following the quench in PF and CS coils, HR plant should come in stand-by mode after handling quench and HR plant starts controlled cool-down or controlled warm-up on request of operator.

6.6 Controlled Shut Down

The plant controls should be able to carry out the shut-down process automatically in proper systematic way. The helium inventory of the plant should be stored back into the medium pressure storage tanks (buffer capacity).

6.7 HR Internal Operational Modes

This mode defines internal operation modes such as cold-box vacuum, cold-box rinsing and air/water regeneration of 80 K char-coal bed. The modes are fully automatic and as per vendor's

process design. Manual interventions are not acceptable to interpret or operate these operating modes.

6.8 Dummy Load / Heater for Capacity Testing

A suitable load / heater of wattage equivalent to the total capacity of the plant should be incorporated in the plant (may be in the sub-cool Dewar or internal piping with isolation valves). This will ensure an independent testing of the plant before connecting to the PF and CS SCMS. The dummy load is required to carry capacity testing each time before and after major maintenance of HR. The supply and automatic operation of dummy load is in the scope of vendor.

7. Functional Specification of Helium Refrigeration

A 900 W @ 4.5 K Helium refrigeration (HR) system should have following main subsystem. This section describes functional specification of various subsystems of HR.

7.1 Main Compressor System

- Appropriate stages of the reliable water-cooled compressor for 3 months continuous operation on 24 x 7 basis should be provided. The compressor motor must be designed to operate under ambient temperature of 45°C. However, vendor may decide on the number of compressor(s) that meets the above operational requirements. The compressor should be equipped with variable frequency drive (VFD) for controlling the throughput of the helium gas as well as power saving.
- The suction filter at the input, oil filters and after coolers at the output should be provided. The compressed gas mixed with the oil should be cooled with chilled water within the after cooler. The compressed gas mixed with oil should be separated coarsely in primary / bulk oil separator system. The fine separation of oil from compressed helium should be done in oil removal system. These systems should be supplied with sound proof casing (if required) to minimise the noise. The noise level (less than 80 dB at a distance of 1 m) as well as vibration level (less than 5 mm/s) of compressor system should allow operating the other cryogenic system in the same building. However the compressor system should be mounted on suitable skids with vibration isolation pads so that vibrations should not transfer to the other system.
- The control system should contain operational and protective devices and a local emergency stop. The local monitoring and control panel should have provision for interfacing to the external monitoring and control system. The compressor station should be provided with proper control, ON-OFF, relief / safety valves and smart instrumentation for pressure, temperature, current, voltage, frequency measurement. The mains electrical system is to be equipped with proper protective relays such as phase, over-load, under / over voltages, over temperature protection for induction motor and screw compressors. The variable frequency drive control should also be automatic as per the requirement from the application/load side. The local control system of compressor system should be linked to master control system of cold box for automatic operation of helium refrigeration system.

7.2 Oil Removal System (ORS) & Gas Management Panel (GMP)

- The compressor system must be followed by oil removal system to remove the oil aerosols and vapours from compressed helium gas to 10 ppb level. The oil aerosols from compressed helium gas should be removed by set of coalescer filters in series. While the oil vapours from compressed helium gas should be removed by special activated char-coal bed. The arrangement should be made for reinjection of the oil into the compressors from the bulk and final stages of oil removal system. The oil removal system should be equipped with oil level switches for fault / alarm as well as auto drains purpose.
- The gas management panel and control unit should be provided with proper flow control valves, flow meters, pressure, temperature and other necessary instrumentations. The gas management panel is responsible for managing the gas from / to buffer system for variable demand helium gas for cold power production in cold box. The gas management panel must equip with three control valves to regulate discharge pressure and suction pressure of compressor station with by-pass valve. The control system should contain operational and protective devices and a local emergency stop. The local monitoring and control panel should have provision for interfacing to the external monitoring and control system. The local control system of gas management panel should be linked to master control system of cold box for automatic operation of helium refrigeration system.
- The impurity monitoring system / analyser shall be provided at outlet of oil removal system at compressor hall or at the inlet of cold box at cryogenic hall to measure H₂O, N₂, hydrocarbon (C_xH_y) and oil aerosols in helium gas.

7.3 Cold Box

The cold box should consist of following items:

- Well efficient brazed aluminium heat exchangers
- Cryogenic expansion turbines
- Dual 80 K charcoal adsorber beds with by-pass and automatic regeneration.
- 20 K charcoal adsorber bed
- Joule Thomson control valves and return port
- Cold piping
- Vacuum pumping set
- Control system and state of the art process instrumentation
- Auxiliary components
- The brazed plate-fin aluminium heat exchangers are to be designed, manufactured, tested and stamped in accordance with the design code. The heat exchanger passages operating at compressor final discharge pressure shall have design pressure of 20 bar (g). Helium mass spectrometer leak testing of each exchanger at working pressure, at a sensitivity of 1×10^{-6} mbar-l/sec, shall be performed at the factory prior to shipment and same leak testing sensitivity

should be maintained during fabrication. Cold surfaces are wrapped with an appropriate number of layers of super-insulation to reduce radiation from the ambient temperature.

- The cryogenic expansion turbines should be supplied as compact units consisting of an expander, brake, ancillary systems, instrumentation and controls. Numbers of turbines should be supported on requirement and process design calculation. The expansion turbines should be very rugged, high level of reliability, maintenance free and have contact free technology to avoid wear during start & stop and rotation phases. The mean time between failures (MTBF) of expansion turbines should be more than 150,000 hours.
- For optimal performances, the vacuum in cold box must be lower than 10^{-6} mbar. For this reason two-stage pumping set should be provided. The primary pump should be a roughing mechanical pump and secondary pump should be turbo molecular pump. Both pumps should be controlled by process controller and suitable vacuum gauges. Proper gate valves should be arranged for fully automatic operation of cold box vacuum system during start-up, normal operation and failure conditions.
- The control system should contain operational & protective devices and a local emergency stop. All the monitoring and controls should be possible from the main control system. Vendor is responsible for selection of failure to open (FO) or failure to close (FC) valves as well as control logic such that in any circumstance the helium piping should not be pressurised during failures and off-normal operation events.
- The smart instrumentation shall be provided for temperature, pressure and flow measurement at the outlet of cold box for measurement of process parameters of cold helium.

7.4 Control and Protection System

- The refrigerator should be fully automatic with necessary process instrumentation and industrially proven state of the art programmable logic controller (PLC) & computer based visualisations such as supervisory control and data acquisition system (SCADA). A provision should be provided to interface the monitoring and controls through Ethernet / serial communication connection to main control system for the remote monitoring, exchange of data and emergency signals with sampling rate of 1 Hz or better. Development of supervision system is the scope of vendor. The plant should be equipped with appropriate sensors and sufficient protection system for the subunits against any kind of failures. The control system should be able to take care of the variation in the application load.
- Plant must be fully automatic with state of the art PLC based SCADA system such that plant can be operated by minimum one person with skills of basic engineering / science background. (PLC such as Siemens, Schneider electric and SCADA like WinCC, Wonderware). Licenses for PLC and SCADA software shall be supplied by vendor. Control system of plant must mitigate in-plant faults and shut down / standby process safely on external faults. The plant must be supplied with equipment / instruments which have technical support and availability up to 10 years from the date of installation. Vendor shall supply operation and service manuals of PLC, SCADA, control logics / sequence and explanation of process for all modes.

- Vendor shall provide general control network architecture for plant control system showing hardware and software details.

7.5 Remote Operation

- Suitable hardware & software for monitoring, diagnostics and operation from remote location (through internet) shall be supplied by vendor.

8. Vendor's Scope of Supply

This section describes scope of supply and services provided by vendors.

8.1 Design, fabrication and testing of individual items at the contractor's site

The vendor should consider helium refrigeration plant as a turnkey project and following activities should be carried out.

- Final P&ID with all the detailed instrumentation, controls, valves, turbines, heat exchangers etc. to be submitted based on the given PFD for Helium Refrigeration system.
- Design & Engineering includes:
 - a. Thermo hydraulic and process calculations should be carried on the proposed system. Each and every component has to be designed properly and to be documented.
 - b. Flow distribution in the system and pressure drops.
 - c. Thermal stress & deflection analysis of the integrated assembly
 - d. Design and analysis of mounting structure and supports for components of system should be carried out as per internal standards.
 - e. Flexibility analysis of all the piping layouts should be carried out by vendor. If vendor feels to put some flexible hoses for flexibility then he has to justify it and the procurement will be under the scope of vendor.
- Technical review of design, calculations and modifications or iterations if any required should be done prior to fabrication.
- Vendor is requested to provide all detailed dimensional drawings of all components including end connections; final assembly sequence with drawing and documents, detailed quality assurance and checking (QA/QC) plan should be forwarded to IPR for review and approval.
- All the process instrumentation required in terms of pressure, flow, level, temperature, vacuum, current, voltage measurements etc. is under contractor's scope.
- All the components used in proposed system should be from the standard well-known companies only and vendor should take the approval for the same before purchasing.
- The fabrication should be done as per international standard and workmanships.
- All the design documents, analysis reports, simulations have to be submitted to IPR for approval before fabrication / integration.

8.2 Pre-despatch inspection including the inspection of the cold box assembly and approval for despatch by purchaser's representative

IPR representative will do pre-despatch inspection of individual component and complete system at different stages of fabrication, procurement and factory acceptance tests. The stages will be agreed mutually with IPR.

- Physical Inspection of screw compressor, Oil removal system, expansion turbines, heat exchangers, valves, process instrumentations, gas analysers, control system, control logics and supervision system etc.
- Checking of component listed in above at test bench
- Testing of main screw compressor at its vendor's workshop / site.
- Full performance test of cold box with sub-cooler Dewar at low temperature and demonstration of cold power at vendor's workshop along with test compressor or main screw compressor.
- The vendor should provide facility for testing of screw compressor and turbines
- Leak test of individual and integrated components including all valves
- Verification of all the relevant Test certificates (i.e. material, hydraulic performance etc.)
- Performance test on sub-cooler Dewar (Pressure, Leak test, Net Evaporation Rate(NER))

The vendor shall detail out the tests to be performed at vendor's shop, and submit the same for approval by purchaser. The following tests shall be carried out at vendor's shop but not limited to following:

8.2.1 Helium leak test of main helium compressors and integrated compressor system / oil removal system

8.2.2 Refrigerator cold box

- Conformity of internal and external piping with P & I diagram (check should be done before superinsulation is installed)
- Functional test of all the instrumentations in the simulations mode
- Leak test:
 - Helium to vacuum and helium to air (outside piping)
 - Ambient air to vacuum
 - Pre-cooling nitrogen to helium and vacuum
- Smooth operation of all valves and leak tightness of valve seats (Prior to CB assembly)
- Simulations of control logics, sequences with interlocks and different modes

8.2.3 Mechanical test run of the turbines up to design and trip speed before assembly and integration to cold box on test bench

8.2.4 Performance test run of complete cold box with Sub-cooler Dewar and demonstration of cold power

8.2.5 Calibration of level, temperature sensor of Sub-cooler Dewar

8.2.6 Control system

- Cabling check of all instrumentation, electrical etc.

- Simulations of several sequences

General conditions for tests at manufacturer's / contractor's site:

- a) The manufacturer should write a protocol on all tests, which have to be approved by contractor's project manager
- b) The purchaser reserves the right to participate in person or by a representative during the tests. The tests should be incorporated in the project time schedule, which have to regularly updated, such that the purchaser can reliably schedule the visits
- c) All documents needed for the shop tests shall be sent to purchaser at least three weeks before the shop test takes place
- d) All deficiencies found during the shop tests have to be removed before shipping of the equipment to the purchaser's site.

8.3 Shipment of the plant as per terms and conditions

Vendor is responsible for safe and convenient shipment to purchaser's site.

8.4 Installation and commissioning of the HR Plant at IPR site

Onsite installation means preparing installation instructions and brings technical assistance (focusing on specificities) during on-site installation of the individual components. Also managing and performing the installation of the equipment on site until mechanical completion. Vendor shall carry out the installation of the equipment on site in compliance with the specifications provided by them. The installation will be carried out by vendor with purchaser's team. After the successful installation, commissioning of the plant will be carried out by the contractor. Contractor bears overall responsibility of the successful installation and commissioning.

Following tasks/tests will be carried out before commissioning by vendor:

- a) Vendor should bring all temporary piping and tubing (including fittings, connectors etc.)
- b) Vendor should provide portable gas analysers, portable process calibrators, multi-metres etc.
- c) Vendor should bring classical tools for installation such as lifting and handling devices, usual tooling for installation and operation, Special tools for turbo-expander assembly.
- d) Radiography or DP shall test all the in-situ joints as per the suitability for individual joints, if required.
- e) Performing pressure tightness and cleanliness tests according to the criteria indicated in the installation instruction documents. Vacuum and helium Leak test at room temperature of entire assembly will be done by vendor and all integrated leaks shall be less than 1×10^{-6} mbar – l/s.
- f) Conformity of all external piping, cabling and dimensions with P&I diagram
- g) All the tests made at the contractor's site have to be verified for equal performance at purchaser's site
- h) All required electrical and instrumentation cabling laying between equipment and electrical / instrumentation panel of the equipment shall be under the scope of vendor

- i) Simulations of control functions of valves, interlocks, process transmitters etc.
- j) Measurement of plant performance in at least at 4.5 K as part of the commissioning period before the readiness for the acceptance test is announced by the vendor
- k) Conformity with specifications and quality assurance plan
- l) Completeness of documentation
- m) All deficiencies found during the commissioning tests have to be removed, before the vendor can announce readiness for the acceptance test

Clarity on the responsibility of installation scope is given in Annexure – 2. Installation of the scope of supplies by the bidder and entire commissioning shall be bidder's scope. All gases for installation & test (helium and nitrogen), compressed air, power supply, water will be provided by IPR.

8.5 Acceptance tests at purchaser's site

The contractor shall detail out the tests to be performed at purchaser's site, and submit the same for approval by purchaser. The overall guidelines for final acceptance test are as below:

- a) Different mode of operation should be performed on Helium Refrigerator (HR) at the IPR site.
- b) The entire helium circuit will be subjected to pneumatic pressure test at bar (1.10 times the design pressure) (As per ASME or PED/AD2000 standard).
- c) After pneumatic test is carried out further He leak tightness test will be done for the entire circuit.
- d) During cool-down, steady state and warm up cycle thermo-structural stability, uniformity and flexibility of the whole integrated system will be ensured.
- e) Establishment of instrumentation and control, flow parameters and their variations. All the input / output process values should be displayed in the local panel and the signals should be taken in the supervision SCADA system supplied by vendor for its operation and control. If any problem occurs then vendor has to solve the problem with IPR.
- f) If the desired parameters achieved during testing are not satisfactory then necessary adjustments/modifications shall be done by the vendor without any extra cost.

The following tests shall include as acceptance tests at purchaser's site but not limited to following:

8.5.1 Main Helium compressors

Test run with helium as working fluid with measuring of:

- a) Mass flow rate at full load
- b) Power consumption
- c) Output temperature (i.e. sufficiency of oil flow)
- d) Negligible vibration of machine and piping
- e) Smooth operation of screw compressor with VFD for 35 % to 100 % range

f) Mass flow and power consumption in dependence of VFD set-point

8.5.2 Refrigerator cold box

a) Functional test of all the instrumentations in the simulation mode

b) Leak test: i) Helium to vacuum and helium to air (outside piping)

ii) Ambient air to vacuum

iii) Pre-cooling nitrogen to helium and vacuum

c) Smooth operation of all valves

8.5.3 Performance run of expansion turbines at design conditions (or similar) with measurement of mass flow and other parameters

8.5.4 Sub-cooler Dewar (SBD)

a) Boil off rate or Net Evaporation Rate (NER)

b) Performance of instrumentations within the SBD

8.5.5 Control System

a) Cabling check of all instrumentation and electrical

b) Simulation of several sequences with all process interlocks

c) Performance of actual program with process and optimization of control logics for various modes and debugging the program for any logical bugs during operation. Different automatic sequences and emergency procedures will be also tested during these tests.

d) The control system shall be fully automatic with state of the art programmable logic controller and all the set-points, control loop tuning parameters, timers shall be adjustable from the supervision SCADA system. The PLC program should not be used as operator screen. All the commands, status check, turning parameters should be done from supervision program or SCADA system.

8.6 Man Power training for operation and maintenance of the plant at IPR's site during installation and commissioning

Bidder shall provide three day training to all cryogenic personal at purchaser's site. In addition, bidder shall provide practical training on all stages of installation, commissioning, start-up, cool-down and acceptance testing of the refrigeration plant. Bidder shall prepare a troubleshooting list and explain the procedures for trouble shooting step by step. The content of training shall be process operation, servicing and maintenance, safe operation description, emergency shutdown process, start-up process as well as explanation on operation manual, maintenance manual and troubleshooting procedures.

Training documents and language of the training shall be in English.

8.7 Documentation to be supplied including but not limited to the following

- a) Plant layout and engineering details including drawings
- b) Process calculations and related engineering drawings
- c) Quality assurance plan
- d) Test procedures
- e) Time schedule
- f) Cold box drawings and interfaces
- g) Control software including the instructions for modifications
- h) General plan of the tubes inside and outside cold box
- i) Operation, preventive and routine service manuals
- j) Manuals for process instrumentation, sensors, motors, compressors, programmable logic controllers (PLC), SCADA system
- k) Software including source codes and manuals
- l) Material test certificates of all components i.e. piping, heat exchangers, activated char-coal, valves etc.
- m) Calibration test certificates for each instrumentation, VFD, screw compressors, vacuum gauges, superconducting level sensors and all auxiliary equipment in HR.
- n) Chemical database (spectroscopic data and physical properties) of oil used in helium screw compressor with different level of impurities.

8.7.1 Mechanical and performance guarantee certificates of each components used in HR plant i.e. turbines, heat exchangers, screw compressor, VFD, induction motors, PLC, SCADA systems etc.

8.7.2 Installation kit including all tools, wrenches etc. and any other special tools required for maintenance, electrical switch gears/contactors, fuses, special fittings etc. shall be provided by vendor for installation and commissioning activities at IPR.

8.7.3 Interconnection details wherever necessary e.g. Warm gas Recovery line, Inlet connection to the main compressor from the medium pressure helium gas vessel etc. shall be provided by vendor before installation and commissioning activities at IPR.

8.7.4 Spare parts needed for operation and maintenance for two and five years.

Bidders are advised to suggest appropriate spares including consumables and replacement parts with maintenance plans for 4000 hours of operation per year. Bidders shall give offer for the 2-years and 5-years operation spares kit (including major maintenance kit) respectively. Bidders shall offer an optional cost for spare turbine kit also. These prices shall be quoted on unit price basis.

Bidders shall offer an optional cost for dual line drier skid with manual switch over and regeneration unit. Each line drier should consists of a vertically mounted desiccant bed, pressure gauges, valves and pressure regulator including the regeneration skid with thermostatically controlled heater for the manual regeneration of the adsorbent.

9. Progress Review Meetings (At Vendor Site and At Factory Site)

Vendor shall submit pert chart of schedule of fabrication of plant in advance to IPR. Vendor shall inform 3 week in advance for any test activity at vendor's site and provide the documents for approval before tests. All the mutual tests shall be witnessed by IPR representative at vendor's site or third party site for acceptance. All the test observation will be documented and reviewed at IPR for acceptance. Vendor shall submit all the test report mutually agreed for pre-dispatch of equipment and approval is needed prior to shipment.

Vendor shall provide following information during project execution

- a) Details of all the necessary piping and other accessories to be supplied by IPR
- b) After sales service
- c) Annual maintenance contract charges
- d) Brief information about your set-up's in India for after sales services
- e) Assured supply of all the spares for 10 years if the production of model is discontinued.
- f) Names and addresses of the parties within India and abroad where similar plants have been installed.

10. Acceptance Criteria

Performance of all the components of the plant as per the specifications described in functional specification and operation requirement are measured for the continuous operation for at least 8 hrs. Once the rated performance of the HR is achieved with dummy load, the HR shall be treated as accepted by IPR.

11. Delivery Schedule

The delivery time shall be 14 months FOB seaport from the date of signing the contract. 5 months for shipment, installation, commissioning and final acceptance test at purchaser's site. Total project duration shall be 19 months from the date of signing the contract.

Vendor shall provide delivery schedule during technical bid and detailed pert chart or delivery schedule after releasing purchase order. The vendor shall be bind to strictly follow the delivery schedule.

12. Purchaser's Scope of Supply

Following items shall be excluded from the scope of supply. It is the scope of purchasers.

12.1 High pressure and medium pressure storage systems

The high pressure storage system (at 150 bar (a)) and buffer tank (at 14 bar (a)) will be provided by purchaser to store the required helium gas. The contractor shall provide the requirements for intermediate buffer vessel and provide fittings, valves etc. required for integration of the gas storage vessels to the plant.

12.2 Recovery system

Both, the recovery compressor and recovery gas bag will be provided by purchaser. The contractor should arrange for the interfacing of the plant to these units.

12.3 All utility requirements and man power during installations

- Electrical power (Mains and UPS)
- Chilled water
- Compressed air
- Necessary working fluids

The contractor needs to inform purchaser at least 3 months before the start of installation activity about the requirements.

12.4 Space and buildings

IPR will provide appropriate defined free space as required by Vendor (Refer mentioned Section 5 of this document)

13. Standards and Codes to be followed

The following standards or equivalent international standards should be followed while designing, manufacturing and inspection. Test certificates should be produced in this regard.

- All pressure vessel: According to CODAP code (2010 version) or ASME (American Society of Mechanical Engineering) code or PED97/23/EC (European Pressure Equipment Directive).
- Shell, tube heat-exchangers & water cooled heat-exchangers: According to CODAP code or TEMA (Tubular Exchangers Manufacturers Associates) or PED97/23/EC (European Pressure Equipment Directive).
- All threaded points, flanged process and utility connections: According to CODAP and CODATI codes or ANSI (American National Standard Institute & Standard dimensions).
- All cryogenic piping design: According to EN or NFEN standard, ANSI and CGA.
- All electrical Equipment and wiring: According to EC regulations or NEMA (National Electrical Manufacturers Association) and NEC (National Electrical Code).
- Structural steel and miscellaneous structures : According to ISO standard or AWS (American Welding Society) and ASTM (American Society for Testing and materials)

14. Eligibility Criteria for the vendors

- I. Bidder must have experience of at least 10 years for design, fabrication, installation and commissioning of large scale (kW class) cryogenic helium plant. *At least one un-priced purchase order copy of an installation carried out on or before year 2005 shall be submitted as proof.*
- II. The bidder should have supplied and installed more than ten (10) cryogenic helium plants across the world. *Summary list of cryogenics helium plants with key information shall be submitted.*

- III. The bidder must have technology know-how and R & D facility of cryogenic expansion turbines manufacturing and development. *Relevant support documents shall be submitted as proof.*
- IV. The bidder must have installed and commissioned at least two helium refrigerators or liquefiers of 400 W @ 4.5 K cold capacity or higher as a turn-key system to any government or reputed private organization in India. *Relevant un-priced purchase order copies and client completion certificates shall be submitted by the bidder as proof.*
- V. Average Annual turnover of the bidder for last 5 years shall be 350 Million Indian Rupees (INR) or equivalent. *Relevant documentation such as audited balance sheet or certified annual sales turnover statement shall be submitted by the bidder as proof.* Bidder should have not made losses in more than 2 years during last 5 years.

15. List of Queries to the Vendors

The vendor should specify the following along with the offer.

Sr. No.	Subsystems	Enquired Parameters	Supplied Values
1.	Electrical power requirement for the various units	Main Compressor Cold box Instruments & Control system	
2.	Cooling water requirements for various units	Flow Rates Supply Pressure Supply temperature Return Pressure Return temperature pH Value Gross Hardness Gross salt content	
3.	Liquid Nitrogen & Gaseous Nitrogen Requirement for Various Units	Supply Pressure of Liquid Nitrogen Flow Rate of Liquid Nitrogen Supply Pressure of Gaseous Nitrogen	

4.	Details of Main compressor and oil removal system	<p>Type and Make of screw compressor</p> <p>No. of stages</p> <p>Suction and Discharge pressure and acceptable variations</p> <p>Type and amount of oil required</p> <p>Frequency of oil refill</p> <p>Oil impurity at compressor output</p> <p>Oil impurity at Oil removal system output</p> <p>Nos. of coalescers filter in oil removal system</p> <p>Type of purifier used at the output of oil removal system</p> <p>Acceptable load variations</p> <p>Acceptable input voltage fluctuations</p> <p>Maximum gas leakage rate</p> <p>Noise level with and without sound proof casings</p> <p>Acceptable vibrations level</p> <p>Indicators provided on the front panel</p> <p>Type and manufactures of PLC at compressor and ORS systems</p>	
5.	Cold Box	<p>Types of LN₂ pre-cool Heat exchangers</p> <p>Nos. of plate fin heat exchangers</p> <p>Nos. of cryogenic expansion turbines</p> <p>Types of 80 K / 20 K adsorber bed</p> <p>Nos. of Joule Thomson valves</p> <p>Nos. of return ports</p> <p>Nos. of return valves (300 K, 80 K, 20 K, 4.5 K etc.) to LP lines</p> <p>Types of vacuum systems</p> <p>Orientation of cold – box (vertical or horizontal)</p>	

6.	Control and Protection Systems	Control and Protection systems provided for cold box, Main compressor and oil removal system Types and manufactures of PLC Types of manufactures of Supervision / SCADA system Types of control software etc.	
7.	Dimensions	Physical dimensions of all units	
8.	Instrumentation details	Type of sensors used to measure Temperature Pressure Diff. Pressure Flow Rate Fluid level Water Flow switches Mains electrical current measurement Types Low voltage electrical Protection system	
9.	Installation site requirement	Working and Installation area / height Civil work required at the site Temperature Relative Humidity	
10.	Installation support		
11.	After sales support		
12.	Manpower training		
13.	Delivery time		
14.	Warranty period		
15.	Service interval		
16.	Fire protection & fire proofing requirements		
17.	Prices item wise in detail		
18.	Terms of payments		

19.	Conditions for sale	
20.	Feasibility of future up-gradation	
21.	Validity time of the quotation	

ANNEXURE - 1

Following layout shows IPR site plan with SST-1 Cryogenic and Compressor Hall. Black line shows the routing of high pressure (HP) & low pressure (LP) lines between compressor and coldbox of new HR.



ANNEXURE – 2

Responsibility Matrix for Installation Scope

Item	Basic design	Detailed design	Procurement	Installation technical supervision	Installation works	Cleaning	Non-destructive tests
Preparation of the site including civil works if necessary	IPR	IPR	IPR	IPR	IPR	IPR	NA
Warm lines between compressor and ORS/GMP	BIDDER	BIDDER	BIDDER	BIDDER	BIDDER	IPR	BIDDER
Warm lines (LP & HP) between oil removal system at compressor hall to cold box at cryogenic hall	BIDDER	IPR	IPR	BIDDER	IPR	IPR	IPR
Lines between the output of safety valves to the recovery system at compressor hall and cryogenic hall	BIDDER	IPR	IPR	BIDDER	IPR	IPR	IPR
Utilities lines (Instrument air, LN ₂ , GN ₂ , cooling water)	IPR	IPR	IPR	IPR	IPR	IPR	IPR
Cold lines between cold box and dewar or distribution box	BIDDER	BIDDER	BIDDER	BIDDER	BIDDER	BIDDER	BIDDER
Cold lines from cold box and Dewar / distribution box to SST-1	IPR	IPR	IPR	IPR	IPR	IPR	IPR
Warm line between CL and CB (300 K return)	IPR	IPR	IPR	IPR	IPR	IPR	IPR
Lifting and erection of the equipments (compressor, cold box, ORS, Dewar)	BIDDER	BIDDER	IPR	BIDDER	IPR	NA	NA
Electrical cabling (power, control, signal, communication etc.)	BIDDER	BIDDER	BIDDER	BIDDER	BIDDER	NA	NA
Cable trays	IPR	IPR	IPR	IPR	IPR	NA	NA

FORMAT FOR SUBMISSION OF PART-I (TECHNO-COMMERCIAL) OF THE TENDER.

TENDER FORM

Telephone Nos. : PART-I (TECHNO-COMMERCIAL)
OF TENDER NO. _____
Last date for receipt 21st September, 2016
at 13:00 hrs. IST.
Fax No. : Due date for opening 21st September, 2016
at 14:30 Hrs. IST
E-mail: Tenderer's Offer No. _____ Date _____

FROM

M/s. _____

To
The Purchase Officer
Institute for Plasma Research
Nr. Indira Bridge
Bhat, Gandhinagar-382428
Gujarat
INDIA

Dear Sir,

1. I/We have gone through the tendering conditions pertaining to the Two-Part Tender and General Conditions of Contract and Special Conditions of Contracts contained in Form No. IPR-FP-12. I/we hereby agree to supply the stores conforming to the tender specifications incorporated in Section "C" of the tender documents.
2. You will be at liberty to accept any one or more of the items of stores offered by us and I/we shall be bound to supply you the stores as may be specified in the Purchase Order/Contract.
3. I/We hereby agree to keep the price valid for your acceptance for a period of 120 days from the date of opening of Part-II (Price) of the tender.
4. Deviations to Technical specifications contained in Section 'C' of the tender documents are detailed in annexure-A to the tender form while deviations proposed to the General Special Conditions of Contract are detailed in Annexure-B to this tender. Price applicable for the stores are indicated separately in a sealed envelope marked as Part-II (Price) of the tender.
5. I/We are also enclosing herewith all the leaflets catalogue etc. pertaining to the stores offered.

Encl:

Yours faithfully

Stamp and Signature of the Tenderer

FORMAT FOR SUBMISSION OF PART-II – PRICE BID (PRICE ALONE) OF THE TENDER.

PRICE BID FORMAT

(Bidders are requested to offer their price in the following format)

ENQUIRY No. IPR/TPT/TN/PUR/F/16-17/8 DATED 03-08-2016

“Process Design, Fabrication, Factory Acceptance Tests, Supply, Installation & Commissioning, Site Acceptance Tests and Training of 900 W @ 4.5K Helium Refrigeration (HR) System at IPR.”

(Specify the currency)

Sr. No	Description	Quantity	Unit cost	Total price
1	“Process Design, Fabrication, Factory Acceptance Tests, Supply, Installation & Commissioning, Site Acceptance Tests and Training of 900 W @ 4.5K Helium Refrigeration (HR) System at IPR.”	1 System		
2.	Recommended Spares / Accessories (if any) (add separate sheet as required)			
Total FOB/FCA named Airport/Seaport/Place Price.....				
3.	Installation and Commissioning Charges (Lump sum) (if any)	1 Job		
Total Offered / Quoted Price				

	Indicate percentage (Except Freight) <i>(specify the currency)</i>			
	Percentage	Included	Excluded	Not Applicable
Packing and Forwarding				
Excise Duty				
Customs Duty				
Sales Tax / VAT				

Place:

Date:

Signature of Bidder with Seal

TENDER FORM

Telephone Nos. :

Tenderer's Offer No. _____

Date _____

PART-II (PRICE)

OF TENDER NO. IPR/TPT/TN/PUR/F/16-17/8

Fax No. :

E-mail:

FROM

M/s. _____

To

The Purchase Officer
Institute for Plasma Research
Nr. Indira Bridge
Bhat, Gandhinagar-382428
Gujarat
INDIA

Dear Sir,

In response to your invitation and as per your tendering and contracting conditions, the price and other related commercial conditions applicable for the scope of supply contained in Part-I (Techno-Commercial) of our tender are indicated in the format at annexure "A" to this tender.

We hereby agree to abide by your terms and conditions of contract contained in section 'B' of this tender document. Deviations to your contract conditions are brought out separately in Annexure 'B' to this tender.

We hereby agree to keep the price valid for your acceptance for a period of 120 days from the date of actual opening of Part-II (Price) of the tender.

Yours faithfully,

Stamp and Signature of the Tenderer