



Government of India
Bhabha Atomic Research Centre
Atomic Fuels Division

Ref: BARC / Tender / AFD / ESAS / 2022 / 33129

March 3, 2022

Tender Enquiry

Sub: Design, Fabrication, Supply, Testing, Installation and Commissioning of High Vacuum Isolation Valves along with Accessories, for the Vacuum Melting Furnaces at AFD

Sealed quotations are invited for & on behalf of the President of India for Design, Fabrication, Supply, Testing, Installation and Commissioning of high vacuum Isolation Valves along with Accessories, for the Vacuum Melting Furnaces at AFD.

The scope of work, technical specifications and Terms & Conditions are attached in Annexure - I & II.

1. This Tender will be processed in Two-Part Bid System.
2. The Tender submitted should have two separately sealed envelopes viz.
 - 2.1 First Envelope shall contain Technical Bid (Part - A). **“Technical Bid (Part - A)”** must be written on the Envelope.
 - 2.2 Second Envelope shall contain Commercial Bid (Part - B). **“Commercial Bid (Part - B)”** must be written on the Envelope.
3. The sealed Technical Bid (Part - A) shall contain Technical details of the offer and compliance with respect to our technical requirements, clearly mentioning deviations, if any.
4. The sealed Commercial Bid (Part - B) shall contain the detailed quotation including basic cost, applicable taxes and commercial terms & conditions.
5. Sealed envelopes of the Technical Bid (Part - A) and the Commercial Bid (Part-B) shall be kept in a Single Sealed Cover / Envelope, which shall be treated as your offer against our enquiry.
6. Offers received as (i) Technical and Commercial part in one Bid, or (ii) Technical and Commercial Bids in single envelope or (iii) unsealed Bids will be treated as Invalid, and no further communication will be made to the vendor.

7. Your offer in sealed envelope bearing “**Tender Enquiry No. & Due Date**” should be sent to following address, so as to reach **on or before 28/03/2022 by Registered / Speed Post only**.

Hariom Sharma, TO/D
Engg. Services & Automation Section
Atomic Fuels Division
Bhabha Atomic Research Centre
Trombay, Mumbai - 400 085

8. **Offer received through courier or person or after the Due Date will be treated as Invalid.**

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Hariom Sharma
TO/D, ESAS / AFD

The scope of work, technical specifications and terms & conditions are given hereunder.

1. Scope of work

The vendor's scope of work shall include:

- 1.1 Design of constituent components & accessories of the Isolation Valves, as per the given requirements
- 1.2 Fabrication of all constituent components & accessories
- 1.3 Integration & Testing
- 1.4 Final commissioning and demonstration of satisfactory performance at the site

2. Description of work

2.1 High Vacuum Isolation Valves along with Accessories

The high vacuum Induction Melting Furnaces are working at the purchaser's site to cater vacuum melting of special materials & alloys. Dedicated high vacuum pumping systems are installed at site to obtain the required vacuum level inside the Furnaces.

The proposed high vacuum Isolation Valves are intended to obtain the desired operational sequences and control of the vacuum systems. Accordingly, the Isolation Valves shall be designed to operate at the specified high vacuum levels. The Vendor shall also design the appropriately rated rotary type valve automated actuation system and incorporate the same into the Isolation Valves, to facilitate the auto opening / closing operations. It is further envisaged that the actuation system shall generate suitable & compatible electronic feedback signals, and transmit it through control cables to the main control panel.

Accordingly, the Vendor's scope of work shall include Design, Fabrication, Supply, Testing, Installation and Commissioning of the Isolation Valves, actuation system, feedback & control systems and accessories.

2.2 General Requirements

The Isolation Valve & its actuation system design must be robust, sturdy, reliable and proven. Relevant sealing materials shall be incorporated to obtain the required sealing performance. Appropriate Factors of Safety, as per the prevailing design codes in vogue; may be taken on the relevant mechanical, thermal, electrical and magnetic properties of the constituent materials.

The Vendor shall carry out design calculations, envisaging the requirements and arrive at the appropriate sizes & dimensions of the constituent components / accessories. Due justifications for the sizes & dimensions thus arrived, shall be submitted for the purchaser's approval. Further, at the time of site visit, the vendor shall have to furnish documentary evidences to substantiate their capabilities and proficiencies pertaining to execution of such works. The admissible documentary evidences shall be similar nature work orders executed in the past.

The Vendor shall have to prepare detailed fabrication drawings considering the site constraints, and submit it for the purchaser's approval, before commencing the work execution. All materials, labours, consumables etc shall be in the vendor's scope of work. No additional cost claims shall be admissible afterwards. Hence, the quotations shall be furnished on lump sum basis only.

These Valves shall be erected in the radioactive environments. Therefore, vendor shall design the Valves, actuation system, control systems, feedback systems etc, accordingly. Further, the vendor shall also have to adhere with the mandated radiation protection measures while working at the site.

3. Technical Specifications

3.1	Description	:	High Vacuum Isolation Valves along with Accessories
3.2	Quantity	:	10 Sets
3.3	Size	:	10" NB
3.4	Duty Cycle	:	80%
3.5	Material of Construction	:	Stainless Steel, grade 304 L
3.6	Working Temperature	:	200 °C
3.7	Ambience	:	High vacuum @ 1×10^{-6} MPa (at both ends)
3.8	Maximum permissible Leak Rate	:	1×10^{-9} mbar – Litre / second
3.9	End Connections	:	ISO Flanged <i>(Additional Two Nos. of matching Flanges for each Valve, shall be supplied by the Vendor)</i>
3.10	Working Fluid	:	High temperature Off-gases released during the Vacuum melting operations of special materials & alloys
3.11	Capacity of the Vacuum Pumping system:		3000 m ³ / hour
3.12	Size of the solid particulates	:	≈ 10 micron
3.13	Valve Actuation system	:	Rotary type Actuator only <i>(To be designed by the Vendor)</i>
3.14	Feedback system	:	Visual Indication as well as Electronic signals
3.15	Control system	:	To be integrated with the main control panel at site, by the Vendor
3.16	Power source available at the site	:	230 / 415 V AC 50 Hz

4. Fabrication

- 4.1 All fabrication shall be as per ASME Section VIII Div. 1
- 4.2 All welding shall be by GTAW only. Welding procedure and welders shall be qualified as per the ASME SECTION IX.
- 4.3 Prior to production welding:
 - 4.3.1 All weld seams shall be ground flush after completion of welding.
 - 4.3.2 Prior to actual production, fabrication drawings and welding procedures shall be approved by the purchaser.

5. Inspection & Quality Control

Vendor shall submit the detailed fabrication procedure along with the offer. This shall include:

- 5.1 Fabrication and inspection stages and testing methods in sequence listing all in details.
- 5.2 Procedures for welding and stress relieving.
- 5.3 Weld sequencing and identification.
- 5.4 Detailed fabrication drawing indicating weld configuration, location, weld joint identification and dished end etc. shall be submitted prior to taking up the production.
- 5.5 The vendor shall submit following Test Certificates before commencing the fabrication work. All the tests shall be arranged by vendor at his own cost. Material Test certificates shall be required w.r.t:
 - 5.5.1 Chemical composition
 - 5.5.2 Ultimate tensile strength & Yield Strength
 - 5.5.3 Bend Test
 - 5.5.4 Material Test Certificate
- 5.6 Purchaser's representative shall have complete access to the works and vendor shall provide all necessary instruments, tools and documents etc. to conduct the checks.
- 5.7 Time schedule,
The firm shall submit schedule for the following for timely completion of the order,
 - 5.7.1 Fabrication drawings / Fabrication schedule
 - 5.7.2 Quality assurance plan & stage wise inspection schedule
 - 5.7.3 Welding schedule and Welder's qualification

6. QAP (Quality Assurance Plan)

Vendor shall submit a documented procedure for Quality Assurance Plan and get it approved from the purchaser. The QAP shall include,

- (i) Raw material Testing (ii) Manufacturing operations (iii) Fabrication Steps (iv) In-process Inspection Stages (v) Final testing methods (vi) Welding procedures, Weld sequencing and Cleaning procedures (vii) Procedures for weld checking

7. General Requirements

- 7.1 Vendor shall carry out actual measurements at site and suggest deviations (if any) to make necessary changes, if required.
- 7.2 Vendor shall prepare its own fabrication drawings as per actual site conditions and should get it approved from concerned authority, before commencement of work.
- 7.3 All fabrication work shall be carried out as per the approved drawings only.
- 7.4 All material supply is in the scope vendor. Vendor shall use all relevant IS standard material for this work. Material testing reports (Chemical, Mechanical etc) from government approved labs should be submitted for approval. Material identification and stamping shall be witnessed by the departmental representative.
- 7.5 Vendor shall have to pass weld qualification and only qualified welders shall perform this work.
- 7.6 In case of any technical clarifications, vendor should contact the concerned authority.
- 7.7 Vendor shall have to arrange for Arc / TIG welding machine along with all consumables (welding electrodes etc) required for the work execution.
- 7.8 Gas cutting, arc welding, grinding work etc, shall be carried out with the utmost care. Vendor shall follow all safety measures while carrying out such work. Department shall provide gas cylinders for gas cutting purpose, if required.

7.9 Burrs, sharp edges, projections etc caused due to cutting, welding etc shall be removed to maintain smooth surface. Vendor shall maintain best quality workmanship.

8. Inspection and final acceptance

8.1 Physical verification of all components & accessories, as per the technical specifications.

8.2 All surfaces shall have a smooth finish for easy decontamination.

8.3 Vendor shall clear off all left out materials at the end of work and ensure cleanliness of work area, before handing over.

9. Vendors shall have to provide the tentative conceptual design at the time of site visit. Vendors having knowledge and experiences of preparing above mentioned documentations, BARC procedures, standard welding procedures, safety procedures, material testing and inspection facilities, calibrated equipments etc shall be preferred for the works contract.

10. Terms & Conditions

10.1 Offer evaluation procedure:

Only Valid Technical bids will be opened first and evaluated. The Commercial bids of only technically qualified vendors' will be opened, and the lowest quoted offer shall be recommended for placing the work order. For technical evaluations, all Vendors shall have to fill & submit the attached Annexure – II.

10.2 Work completion period is SIX months from the date of issue of the work order.

10.3 Taxes, if any, shall be specified separately. Percentage of GST payable or included in the offer should be shown separately, i.e., Basic cost. Rs. XXXXX/- plus GST Rs. YYYYY/-= Total Rs. ZZZZZ/- . This work is intended to be used for R&D purpose, hence, GST@5% along with GST concession certificate will be provided.

10.4 Any delay which is attributable to the vendor, is liable for penalty @ ½% per week (*max.10%*) to be imposed on the vendor.

10.5 In case of delay in work completion, vendor may send request letter to the concerned authority for extension of work completion period, with proper justification for delay in work. Concerned authority may or may not give extension with or without penalty, depending upon the justification / circumstances for delay.

10.6 Income Tax and other Cess / Surcharges, as applicable, will be deducted from the Vendor's bill.

10.7 Vendor shall give the guarantee for a minimum period of One Year for the workmanship & satisfactory performance.

10.8 Vendor may furnish their PAN & copy of GST Registration Certificate.

10.9 100% payment will be arranged after satisfactory completion of work at AFD and on submission of,

- i) Bills in triplicate,
- ii) Advance stamped receipt
- iii) ECS details
- iv) Delivery Challan
- v) Guarantee Certificate
- vi) ITR compliance in prescribed format

10.10 Minimum two workers & a supervisor shall be present at site during the installation & commissioning work. The supervisor shall be experienced enough for safety (*fire & personal*) to oversee the site activities.

10.11 The upkeep of area is the responsibility of vendor. Any unwanted or extra materials shall be kept at the designated area shown by the departmental supervisor. For elevated jobs, proper Safety Belts shall be used by all workers.

10.12 Vendor shall obtain Police Verification Certificate (PVC) for all of his employees including his supervisors & workers engaged in the work.

10.13 Vendor shall obtain Medical Fitness certificates for all of his workers engaged in the work.

11 Confidentiality clause

- No party shall disclose any information to any third party concerning the matters under this contract generally. In particular, any conformation identified as "Proprietary" in nature by the disclosing party shall be kept strictly confidentiality by the receiving party and shall not be disclosed to any third party without

the prior written consent of the original disclosing party. This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by a party with equal force.

- “Restricted information” categories under Section 18 of the Atomic Energy Act 1962 and “Official Secrets” under Section 5 of the Official Secrets Act 1923.
- Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.
- Prohibition against use of BARC’s name without permission for publicity purposes:

“The contractor or sub-contractor, consultant, advisor or the employees engaged by the contractor shall not use BARC’s name for any publicity purpose through any public media like Press, T.V. or Internet without the prior written approval of BARC”

12 Site Visit

The vendors shall have to visit the site to assess & comprehend the scope of work, and the same will be arranged by the undersigned. Vendors must have the previous in the design of high vacuum Valves along with quality assurance plan, and should provide documentary evidence for the same while requesting for the site visit. The site visit shall be cleared only after verifying the credentials of the vendor. The quotations submitted without documentary evidences of experience, will not be considered.

The site can be visited from 14/03/2022 to 15/03/2022 between 10:00 hrs to 14:00 hrs on working days only. However, for the site visit, prior intimation of two working days is required for arranging the entry permits etc. The quotations submitted without site visit will NOT be considered.

12.2 Vendor shall have to carry valid Photo identity card (Driving license, passport, Aadhaar Card) while visiting this premises. Failing to bring valid identity cards, vendors will not get access into our premises. Further, entry permits will not be arranged for next dates if vendors unable to visit the site on permitted dates for any reasons. Vendor should not carry any type of electronic items such as mobile, pen drive, camera etc with him/her at the time of visit.

12.3 For preparing entry permit, you can contact the undersigned on Ph. No. 2559 4927 or can e-mail to hsharma@barc.gov.in giving complete details of Firm, name of visitors, occupation / designation, identity proof, PVC details, probable date of visit etc.

13. Quotations shall be on printed letter head / quotation format which should consists of GST registration number, PAN of the firm etc. Quotations received in computer generated form will be considered as invalid & rejected.

Hariom Sharma
TO/D, ESAS, AFD

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Surendra Kumar
Head, Engg Services & Automation Section
Atomic Fuels Division
(For & on behalf of The President of India)

Technical Requirements to be filled by the Vendor & to be placed in the Technical Bid envelope

	Description	Vendor's Response (Yes / No / Details / Deviations, if any)
1.	Whether Vendor has adequately understood the specifications & other requirements ?	
2.	Whether Vendor has previous experience of designing the Valves for high vacuum applications ? If yes, whether photocopies of executed purchase orders submitted ?	
3.	Material of construction of: 3.1 Valve 3.2 Seals (suitable for high vacuum level & working temperature) 3.3 Accessories	
4.	Details about the item, the Vendor intends to supply: 4.1 Types of Seal 4.2 Type of Valve Actuation System 4.3 Control features	
5.	Safe working temperature of the offered Isolation Valve	
6.	Whether offered Valve is suitable for high vacuum level at both ends ?	
6.	Maximum Leak Rate of the offered Isolation Valve (The Vendor shall have to demonstrate the leak rate at their premises)	
7.	Whether Vendor is ready to demonstrate the required leak rate of Isolation Valve & its Actuation System at the specified ambience i.e. high vacuum level, working temperature etc at their premises ? (The Vendor shall have to simulate the site conditions viz. High vacuum environment, working temperature etc at their premises & with own cost)	

(Signature & seal of the Vendor)