

Government of India
Bhabha Atomic Research Centre
Laser & Plasma Technology Division
Trombay, Mumbai-400085

REF: LPTD/works/SG/ 225612

Date: 27/11/2018

Sub : Maintenance - invitation of quotations.

Dear Sirs,

1. Quotations are invited for maintenance, operation, assembly, testing & troubleshooting of air plasma gasifier and torches as per the details attached in Annexure-D
2. Bidder shall quote for fabrication of these components with material.
3. Taxes and excise duties shall be quoted separately. Form AF shall be provided where necessary.
4. The quotations must reach, **Head, Laser & Plasma Technology Division** by **07.12.2018** and must be sent in a sealed envelope **super scribed** with the above reference number and due date given above.
5. The address on the envelope should read :
The Head,
Laser & Plasma Technology Division
Bhabha Atomic Research Centre,
Trombay, Mumbai - 400 085.
(Attn.: S. Ghorui)
6. The bidder shall have to take an insurance policy against any material issued to him by the purchaser.
7. The fabrication work shall be subject to inspection by our engineer.
8. The bidder shall, complete the work within 18 months from the date the firm work order is issued to the bidder. Installation will be done at **M-34, PRIP Shed, Near Engg.Hall-8, BARC, Trombay, Mumbai-400 085.**
9. Head, Laser & Plasma Technology Division, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.

Yours faithfully,



Head, Thermal Plasma Technology Section

घोडुई एस. / Ghorui S.

वैज्ञानिक अधिकारी (जी) / SO (G)
अध्यक्ष, थ प्ला प्रौ अ / Head, TPTS

ले एव प्ला प्रौ प्र / L & PT Division,

भा प अ केन्द्र / Bhabha Atomic Research Centre

मुंबई-400 085. / Mumbai - 400 085.

Encl.: As above.

Copy to:

1. Accounts Officer, G.S.S. The quotations will be opened at 3.00 PM. on **07.12.2018**
2. Head, LISD, for uploading

Annexure-D

(Specifications and Scope of Work)

**Maintenance, Operation, Assembly,
Testing & Troubleshooting of Air
Plasma Gasifier and Torches**

Annexure-D

(Specifications and Scope of Work)

This work contract is for maintenance, operation, assembly, testing and troubleshooting of equipments associated with Air Plasma Gasifier at Laser & Plasma Technology Division, BARC. The system includes air compressor, 30 Tr chiller unit, gas supply system, water supply system, temperature sensors, water flow pumps, blower units, suction hoods, gas sensing equipments, IGBT power supply, primary chamber of gasifier, secondary chamber of gasifier, alkaline scrubber, stack, plasma torches and other electrical and electronic peripherals and diagnostic units. Scope of this work is summarized in the following. Details of the job are specified in different sections of this document as mentioned.

1. Scope of Work

1.1. Scope of work under operation of the Air Plasma Gasifier:	
	(i) Preparation of waste boxes as per specified content, weight, and dimension
	(ii) Operation of the chiller unit at specific pressure head and temperature
	(iii) Operation of the air compressor, cleaning of the moisture filters of the compressor
	(iv) Loading of the primary chamber with coke
	(v) Cleaning of the primary chamber bottom
	(vi) Cleaning of view port glass
	(vii) Operation of the blower unit and controlling damper opening
	(viii) Operation of scrubber pump and setting flow rates
	(ix) Preparation of 10% KOH solution from solid KOH and feeding into the scrubber tank for top up.
	(x) Cleaning of the strainers
	(xi) Torch ignition, operation at specific power and monitoring
	(xii) Feeding of waste boxes through feeder unit

1.2. Scope of work under assembly of the components includes:	
	(i) Collecting necessary torch components: cathode, torch head, gas injection rings, constrictor, coolant delivery tubes, gas delivery tubes, anode, mounting jacket, insulating sleeves, end plates and joining bolts
	(ii) Checking thread, dimension, integrity of the components
	(iii) Connecting proper components in proper places
	(iv) Making the torch assembly complete
	(v) Preparing the torch mounting jacket fitted with front insulation
	(vi) Fitting the torch assembly inside torch mounting jacket
	(vii) Fitting the torch mounted inside the jacket in the torch port of the primary chamber
	(viii) Finishing gas connections
	(ix) Finishing water connections
	(x) Finishing electrical connections
	(xi) Connecting sensor ports

1.3. Scope of work under testing of the components includes:	
	(i) Hydro-testing of brazing joints
	(ii) Testing of surface finish and integrity of the hafnium insert
	(iii) Dimensional check of all components
	(iv) Test for choking of holes inside the insulating rings
	(v) Test for leakage of water from connecting ports
	(vi) Test of leakage of gas from connecting ports
	(vii) Test for electrical continuity
	(viii) Test for inter-electrode gaps
	(ix) Test for alignment of components
	(x) Test for required flow rate of water through various components
	(xi) Test of KOH concentration in the scrubber tank
	(xii) Test of KOH concentration in the packed bed tank
	(xiii) Test of charging status of the gas sensors.

1.4. Scope of work under troubleshooting of the system includes:	
	(i) Elimination of electrical continuity among separate components
	(ii) Adjusting inter-electrode gap for proper electrical ignition
	(iii) Tightening/loosening of cathode inside the cathode holder to adjust gap between water delivery tube and cathode back surface for proper water flow
	(iv) Elimination of choking of air injection port by o-ring at the base of the cathode
	(v) Preventing leakage of plasma through inter-electrode space due to misalignment and improper tightening

1.5. Scope of work under regular maintenance of the torches includes:	
	(i) Re-orientation of the anode piece after stipulated hours of operation
	(ii) Replacement of the complete anode piece with new one after stipulated hours of operation
	(iii) Replacement of cathode depending on its health
	(iv) Replacement of constrictor depending on its health
	(v) Replacement of spacer rings if found damaged
	(vi) Cleaning of the plasma channel of the torch after stipulated hours of operation.

1.6. Scope of work under regular maintenance of the Primary chamber includes:	
	(i) Cleaning of viewport
	(ii) Top-up of coke bed
	(iii) Removal of residue over coke bed, if substantial

1.7. Scope of work under regular maintenance of Secondary chamber includes:	
	(i) Cleaning residual ash from the bottom port if any
	(ii) Adjusting spark gap of the spark ignition port and ensuring sparks in the spark gap
	(iii) Maintenance of spare ignition torch
	(iv) Cleaning of air injection nozzles

1.8. Scope of work under regular maintenance of venturi scrubber includes:	
	(i) Cleaning spray nozzles
	(ii) Top up of KOH solution level in the scrubber tank
	(iii) Check of KOH concentration in the packed bed tank
	(iv) Changing coupling of scrubber pump if damaged

1.9. Scope of work under regular maintenance of packed bed column includes:	
	(i) Cleaning spray nozzles
	(ii) Top up of water level in tank
	(iii) Checking of KOH level in the water tank
	(iv) Changing coupling of water pump if damaged

1.10. Scope of work under keeping lab area clean and maintaining the electronic, electrical and diagnostic panels dry, clean and dust free:	
	(i) Regular cleaning the room where the system is installed using Indian style broom and mop (ii) Keeping the electronics dust free when the system is not in operation (iii) Wiping out the surface of equipments using moist but not wet towel (iv) Inspecting electronics on regular basis for any damage caused by rat etc.

2. Duration of contract:

Duration of contract is for 18 months from the date of release of the work order, counting all the working days on which system is to be attended

3. Materials/Training:

All the necessary materials, tools required for the maintenance shall be arranged by the department. A thorough training will be will be provided before permission to work.

4. Payment:

Payment will be made on half yearly basis. No advance payment will be made. Payment shall be made by ECS within 4 weeks after every six months on production of three copies of bill addressing the accounts officer, BARC and advanced stamped receipt. The bill shall clearly indicate PAN No, VAT/service tax, details of your bank account etc..

5. Deduction of Taxes:

Income Tax @ 2% will be deducted from your bill as TDS

6. Confidentiality clause:

No party shall disclose any information to any third party concerning the matter under this contract generally. In particular, any information identified as “Proprietary” in nature by the disclosing party shall be kept strictly confidential 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, advisor or the employee of contractor will invite penal consequences under the aforesaid legislation.

7. Prohibition against use of BARC 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, Radio, TV or internet without the prior written approval of BARC.

8. General Terms and Conditions:

- I. The worker shall have to maintain the cleanliness of area assigned to him for the work and shall follow the instructions of supervisor.
- II. Working experience in area of plasma spray coatings or similar is preferable
- III. The work shall be carried out on all working days between 10:00AM to 6:00PM
- IV. Party has to abide by the security procedures for the entry into BARC. PVC (Police Verification Certificate) is necessary not expiring during tender period for all the persons deputed for work inside BARC. Arrangement for above shall be made by contractor himself
- V. Party/contractor and his employee should have experience of working in BARC. Safety procedures shall be strictly followed
- VI. BARC has right to cancel the work order after every sixth month if performance of contractor/employee is found not satisfactory.
- VII. The contractor shall pay the minimum wages to the laborers as prescribed by Government of India from time to time in the presence of representative of Department.

The offer of the contractor indicating payment to one unskilled person under consideration less than the Government approved rate will be rejected.

- VIII. The contractor shall have to obtain the accident-cum life insurance policy for the laborers as per the tender general terms and conditions
- IX. No compensation are payable under this contract. The contractor shall be responsible for payment of compensation, accident, if any during the course of execution of the contract. Taking necessary protection during work is responsibility of the vendor. Work is strictly prohibited without appropriate personal protective equipments.**
- X. During office hours the laborers shall have to observe strict discipline as per BARC security rules and regulation from time to time.
- XI. The laborers deputed shall have to observe the punctuality and report to departmental representative in time.
- XII. The contractor shall give the laborers suitable uniform/dress, safety gadgets, monsoon gears, identity card to identify their staff by security and other departmental personnel.
- XIII. The contractor should maintain laborers daily muster roll and it should be available for departmental check all the time. The contractor should submit the daily labor report both in the morning and evening.

9. Supply of Material

The maintenance job does not involve any supply of material. All necessary material required for the maintenance job are available with the user.