GOVERNMENT OF INDIA
BHABHA ATOMIC RESEARCH CENTRE
REACTOR SAFETY DIVISION

MF-(Enquiry)

Hall.No.7
Trombay
Mumbai 400 085

April 28, 2017

Ref: RSD/CSS/TI/MF/OPA/2017/ 70792

Sub: Minor fabrication – invitation to quote for "Operation, health assessment, repairing-restoration and troubleshooting of all installed equipment, instruments and systems (mechanical, electrical and instrumentation) for BARC Containment model (BARCOM) at Tarapur site"

Sealed quotations are invited by Head, Reactor Safety Division for the minor fabrication job as per the following requirements:

Scope of the work:

i. Loop checking, Wire connectivity checking, Termination of wiring, Soldering of wires at junction boxes /termination panels/ control panels and data collection for health monitoring and also during experiments.
ii. Operation, maintenance and troubleshooting of installed sensors, data loggers and associated instruments as per Annexure-I.
iii. Checking, testing, cleaning, operation and troubleshooting of air compressors, control valves, 440V electrical panels, Diesel Generator, UPS, lighting and other associated equipment as per Annexure-I.

General:

1. Bidder should quote lump sum cost of total work. The sales tax, excise duty and other taxes and charges, if any, shall be indicated separately. **The bidder shall submit complete information asked in the enquiry, otherwise his/her quotations will not be accepted.**
2. The quotations must reach Head, Reactor Safety Division, Engineering Hall No. 7, BARC, Trombay, Mumbai- 400 085 on or before **22.05.2017.**
3. The envelope should be super scribed "Minor Fabrication – BARCOM Test, Tarapur" and indicate the **DUE DATE** and Office **Ref. No.** clearly. The envelope should be sealed.
4. The quotation will be opened on **23.05.2017** at 14.00 Hrs.
5. The necessary items (if any) as given in the enclosed technical specifications (Annexure-I) will be provided by the supplier.
6. **In case the bidder needs to clarify and understand the full scope of his work before submitting the quotation, he may do so by prior appointment with Shri I. Thangamani, SO/F, R. S. D., Engg. Hall No. 7, BARC, Trombay, Mumbai- 400 085 (for appointment please contact on ph. no. 022-25593547 or send e-mail at tmi@barc.gov.in).**
7. Duration of the work is 12 months from the date of acceptance of the work order.
8. The price quoted should be valid for at least 90 days from the date of opening of the quotation.
9. The work is linked with the commissioning and experimental schedules of the BARC Containment (BARCOM) Test Model at Tarapur, which is to be strictly adhered in view of the importance of the project. The contractor shall ensure to be timely present at the site as and when required.

10. A brief list of similar jobs executed, if any and the name of the organization for which the work was carried out should be furnished with the quotation.
11. All Taxes and excise duty shall be quoted separately. Form H and excise duty exemption certificate shall be given along with the order if necessary.
12. Payment will be made as per Government Rules after successful and satisfactory completion of the job.
13. The minor fabrication work will be subject to inspection/supervision by the officer in-charge or his authorized representative.
14. The bidder shall specify that "whether he/she has any relation in BARC or the bidder himself is an ex-employee of BARC or the bidder has an ex-employee of DAE on his payrolls", if any, the supplier shall indicate full details of the concerned person in their quotation.
15. The job should strictly follow "confidentiality clause" as per Annexure-II.
16. Head, Reactor Safety Division reserves the right to accept/reject any or all of the quotations received without assigning any reason whatsoever.

Forwarded 27/9/2017

A. Rama Rao
(Associate Director, RD&DG & Head, RSD)

Encl.: Annexure-I, Annexure-II

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भारत सरकार/Government of India
ट्रॉम्बे, मुंबई-85/Trombay, Mumbai-400 085.

Annexure – I

Minor Fabrication tender number: RSD/CSS/TI/MF/OPA/2017/

SCOPE OF WORK, TECHNICAL SPECIFICATIONS AND GENERAL TERMS FOR "OPERATION, HEALTH ASSESSMENT, REPAIRING-RESTORATION AND TROUBLESHOOTING OF ALL INSTALLED EQUIPMENT, INSTRUMENTS AND SYSTEMS (MECHANICAL, ELECTRICAL AND INSTRUMENTATION) FOR BARC CONTAINMENT MODEL (BARCOM) AT TARAPUR SITE"

A. Scope of Work:

Loop checking, Wire connectivity checking, Termination of wiring, Soldering of wires at junction boxes /termination panels/ control panels and data collection for health monitoring and also during experiments. Operation, maintenance and troubleshooting of installed sensors, data loggers and other associated instruments. Checking, testing, cleaning, operation and troubleshooting of air compressors, control valves, 440 V electrical panels, Diesel Generator, UPS, lighting and other associated electrical and mechanical equipment for BARC Containment model (BARCOM) at Tarapur site.

Details of installation at BARCOM site are as follows for which work is to be done.

1. Data loggers, Sensors & Gauges:

1.1. Data loggers and strain-gauges:

Total 8 data-loggers are installed; the details of sensors number of multiplexors in each data-logger are as follows.

Data-logger No.	Nos. of Multiplexers/ Terminal boxes	Nos. of gauges
DT-1	6 Multiplexers	96 (VWSG type)
DT-2	6 Multiplexers	96 (VWSG type)
DT-3	6 Multiplexers	96 (VWSG type)
DT-4	6 Multiplexers	96 (VWSG type)
DT-5	8 Multiplexers	128 (VWSG type)
DT-6	8 Multiplexers	128 (VWSG type)
DT-7	8 Multiplexers	128 (VWSG type)
DT-8	40 Terminal boxes	400 (SMER type)

1.2. Pressure measuring/indicating instrument/Gauges:

- Pressure transmitter: ABB make, 2600 Series, URL- 2400 KP, LRL-0.07 Abs. and Out-put signal – 4to20 mA - 7 nos.
- Rockwell makes Flow meters with digital display system - 2 nos.
- Digital Pressure Indicator, Model Druck DPI 150, GE make with valves: 2 Nos.
- Dial type pressure gauges of various ranges: 7 nos.

1.3. Temperature & pressure measurement system:

- Dry & Wet bulb temperature measurement assembly consist of M.S. vessel for water, RTDs (Pt.100, 3 wire), fan – 17 sets.
- Control panel: Control panel for dry & wet bulb temperature measurement/display, Pressure of Air receivers, air flow line of compressed air system is displayed at panel through the connected pressure transmitter: 1 no.

2. 60 Numbers of junction-boxes at BARCOM Test Model site.

3. 4 Panels containing 8 computers, 3 connected printers, 2 nos. of extra computers, Computer and projector in conference room.

4. Compressed Air system:

4.1. Screw Air compressor with Air Receiver: Compressor Make- Chicago Pneumatic, Product type- CPC-75, Max. final pressure-7.2 Kg./sq.cm., Free air delivery-306 CFM, Motor-75 HP, starter ES-3000 with driving motor with starting & control panel and with following detail- 3 nos.

4.2. Air drier: Make- Chicago Pneumatic, Type-D-150 (A-13), Product no. - 4102000964- Max. /Working pressure- 13 Bar, Refrigerant type R-404A, 3 phase. , 400 V, 4.15 KW- 3 nos.

4.3. Valves: Manual & Electro-pneumatic actuated Ball/glove valves for compressed air line with position indicator, suitable electric/electronic regulator to provide electric signal 4-20 m. Amp. DC to valve for their closing and opening with varying position (between 0-100%) of valve with manual over-riding mechanism i.e. de-clutchable gear box., Valve-Make- M/s VKE Industries, Mumbai. (Total qty.- 11 nos. as below)

- 80 mm dia. Ball valves- 5 nos.
- 25 mm dia. Ball valve- 2 nos.
- 80 mm dia. Flow control Glove valves- 2 nos.
- 25 mm dia. Flow control Glove valve- 2 nos.

Compressed air Pipe line is a part of this system which is comprised of Seamless pipe of Carbon Steel A-106, Schedule-40 of 80 mm. dia NB (105 m) and 25 mm dia. NB (121 m).

4.4. Remote Control Panel: Remote valve control & position indicator panel for Pressurization & De-pressurization of Containment model building having 11 set of Controller & Position Indicator (of M/s Mugdha Controls, Pune) for remote operation of 11 valves from control room.

5. DG set with AMF supply panel:

5.1. Engine detail: Engine in Acoustic enclosure, Model NTA 855-G2-I, Turbo-charged, After-cooled, Radiator cooled, BHP-380, RPM 1500, make-CIL- 1 no.

5.2. Alternator detail :- Salient pole, self-excited & self-regulated, 320 KVA, 415 V, 50 Hz, 3 phase, 445 Amp, Power factor-0.8, Stamford make.- 1 no.

5.3. AMF panel: Panel is having 2 no. ACB of 800 Amp., 4 pole, electrically operated draw out type (Out of 2 no. ACBs, one is for mains supply and other for emergency supply from DG-set and both are electrically interlocked and wired for Auto/Manual

operation) and 2 no. 400 A, 4 Pole MCCB as O/G feeder- 1 no.

6. UPS panel with battery banks:

5 KVA UPS panel with their battery banks and UPS DBs. Each battery bank is comprised of 120 no. of 2 Volt sealed type cells- 2 sets

7. Fire alarm system:

[System is comprised of panel- 1 no., fire/heat detectors-10 nos. and Response indicators-5 nos.] -1 set.

8. Lighting , power & MCC Panels and Distribution boards:

8.1. Panel having following brief description: 3 nos.

i) Main panel- {Three phase PCC having 630 A TPN Incomer-1 no., 400 A TPN SDF-1 no., 125 A SDF-1 no., and 63 A TPN SDF- 9 nos.}- 1 Set
ii) Weather proof MCC: - {three phase MCC having 400 A TPN Incomer-1 no., 63 A TPN SDF- 3 no., Star/Delta starter for 45 KW motor-3 sets, DOL starter for 10 KW-2 set.}- 1 set
iii) Lighting panel: {Three phase lighting panel with 125 A, 4 pole DPX MCB; 32 A, TPN MCB - 10 no. and 6 A SP MCB- 4 no.}- 1 set.

8.2. DB having following brief description: - 5 No.

i) {8 way TPN DB with 63 A incomer, 63 A, 30 mA RCCB and SP MCB of 6-20 A MCBs} - 3set
ii) {4 way TPN DB with 63 A incomer, 63 A, 30 mA RCCB and SP MCB of 6-10 A MCBs} - 2set

8.3. Exterior & internal lighting and power system:

Different lighting fixtures mounted on wall/ceiling/false ceiling /MS bracket/outdoor GI pole for internal and external lighting of C&I building, Reactor model building, equipment shed and along the road/fence etc. Type of fixture is given below

i) 4 x 18 W FTL Recess type- 16 nos.
ii) 2 x18 W CFL Recess type- 4 nos.
iii) 1 x 11 W PL- 2 nos.
iv) 2 x 36 W CFL- 6 nos.
v) 1 x 36 W FL. Fix. -19 nos.
vi) 125 W HPMV-12 nos.
vii) 35 W LPSV-10 nos.
viii) 150 W Metal halide- 62 nos.

8.4. Earth station & lightning protection system: There are 10 nos. of earthing stations for protection of power supply equipment including lightning protection.

The following are the detailed scope of work to be carried out for the above mentioned installation:

- Operation, Maintenances and troubleshooting of data-loggers and multiplexers and sensors [surface sensors, tilt-meter and surface mounted dial gauges]
- Checking, testing, cleaning, operation and troubleshooting of all the installations mentioned above.
- Maintenances of terminal boxes and junction boxes.
- Collection of data and back-up from data-logger for health monitoring, during dummy runs and all the experiments performed within the period of this work.
- Checking wire loops and correcting the same.
- Termination of wires.
- Correcting loose connections and soldering the wires if required at terminal boxes or junction boxes at site.
- Testing, Checking, repair, replacement/Installation and supply (if required) of various types of lighting fixtures (item 8.3 and 8.4) installed for general lighting of the buildings/areas including street light pole and single phase power points having 6/16/20 amp socket outlet etc. as required for maintenance.
- Testing, Checking, repair, replacement/Installation and supply (if required) of items mentioned in 8.1 and 8.2 as required for maintenance.
- Testing, Checking, repair, replacement/Installation and supply (if required) of items mentioned in 2.
- Testing, Checking, repair, replacement/Installation and supply (if required) of fire alarm system (item 7) as required for maintenance.
- Additional installation of gauges, if required.

B. Operation, testing, checking, cleaning, repairing and troubleshooting:

1. Manpower for the work shall be approved from the concerned engineer in-charge before employing them at site.
2. Supply of Material, Mechanical and Electrical tools and equipment for the above mentioned work will be in the scope of contractor.
3. Transportation of manpower up to the site will be in the scope of contractors.
4. Normal working hours shall be 8 Hrs.
5. Following are the details of manpower to be used for the above mentioned job and shall be **round the clock as and when required**, during the experiment schedule.

Sr. No.	Description of Job	Nos.
1.	Electrician with experience in operating DG and other associated electrical instruments mentioned above	1
2.	Helpers	2
3.	Mechanical operator with experience in compressed air system as mentioned above	1

6. The job may require cutting, welding, bolting, soldering and material handling etc.
7. Free electricity will be provided by the department. However, hooking any instruments to the mains power supply shall be subjected to the necessary approval from the concerned officer.
8. All necessary tools will be supplied by contractor.
9. **No Free issue material will be issued to the contractor for this job.**

C. Work Quality:

All work shall be done with good workmanship. Our supervisor will supervise quality of work.

D. Security permission:

Contractor shall appoint the required workers with high integrity and will be responsible for his workers. All BARC security rules will be applicable. Supplier must dispose of all the debris after completions of the job. Entry permit will be issued on monthly basis.

E. Work period:

Duration of the work is 12 months from the date of acceptance of the work order.

F. Terms of Payment:

1. No advance payment shall be made.
2. Full payments shall be made within **30 days** after completion of the job.
3. Payment shall be made through ECS/RTGS, in favor of the contractor and Accounts Officer, BARC, shall issue the same.
4. The payment shall be made only on the satisfactory completion of the work and on the production of the completion certificate and guarantee certificate.
5. **Income tax @2%** will be deducted from the bill.
6. If contractor fails to deliver the scope of work within the stipulated period mentioned in this document and the delay incurs financial loss to the department, then L.D. charges **@0.5% (max 5%)** as per the rules and guidance of this Department shall be levied.

G. Special note:

The vendor shall be liable for any damage to the purchaser or any third party arising out of any patent or latent defect in the goods supplied by him or sub-standard service rendered by him.

H. Validity of the offer:

Vendor shall clearly mention the validity of the offer and the same shall be **not less than 90 days** from the tender due date.

I. Price Variation:

The prices quoted in the tender shall remain firm throughout the validity period.

J. General Specifications:

1. Quality surveillance, inspection: All work covered by the specification shall be subject to quality surveillance / inspection by our authorized representative. All flanged joints shall be leak tight after the installation.

2. The fabricator shall not sub-contract any or all of the work without written consent.
3. Excise duty is not applicable.
4. Contractor shall note that BARC reserves the right to increase or decrease the quantum of job mentioned here in this document.
5. Any person entering BARC shall comply with all the requirements that are imposed by Health Physics Division and Security of BARC from time to time.
6. All industrial safety rules like using safety shoes, belts, helmets and any other protective items required should be complied with.
7. BARC will not be responsible for any injury or death due to any accident during the work period.
8. The work shall be carried out by the vendor on the basis of provided technical specifications and general conditions.
9. The party shall arrange all the labourers required for the work.

Annexure -II

1. **Confidentiality:** No party shall disclose any information to any third party concerning the matters 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 also apply to the sub-contractors consultants, advisers or the employees engaged by a party with equal force.

2. **"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.

3. **Prohibition against use of BARC' s name without permission for publicity purposes:**
   The contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC's name for any publicity purpose through any public media like press, Radio, T.V. or Internet without the prior written approval of BARC.