Government of India
Bhabha Atomic Research Centre
Metallic Fuels Division

Ref: MFD/DK/17/OPA/195725 Date: 07/11/2017

To

Dear Sir,

We request you to submit your quotation for **"Design, Fabrication, supply, installation, Commissioning and guarantee of Induction Power Supply for High Temperature Application as Per Annexure-I"**.

Yours Faithfully,

(D.Kohli)
Scientific Officer (D)

Encl.: 1.Annexure-I (3 pages)

ANNEXURE-I

SCOPE:

"Design, Fabrication, supply, installation, Commissioning and guarantee of Induction Power Supply for High Temperature Application as Per Annexure-I"

GENERAL:

- Quality assurance certificate of the raw material to be submitted for compostion, purity, etc with laboratory test reports.
- All the welded joints to be subjected to X-ray radiography test to be conducted and report submitted.
- Installation, commissioning and testing of the system to be carried out at BARC

Technical specification

a. Machine power capacity: 60kW
b. IGBT based induction melting machine capable of traking oscillator's frequency at resonance mode at any condition automatically.
c. The machine should have oscillator's frequency at full load from 7kHz to 60kHz for different types and quantities of metals and alloys.
d. Power factor shall be near to unity.
e. Tank capacitor should be water cooled.
f. The matching transformer should be water cooled with high efficiency.
g. The machine should have buck convertor before the oscillator for constant current and power and it should have linear power variation switch at front panel to vary power from 5% to 100%
h. The machine should have Interlocks protection:
    - The generator output and components shall be protected against selectable over-voltage, over-current and against output circuits and faults in the system.
    - Interlocks for all panels and doors.
    - Protections against over-temperature of components and indicators there for.
    - Trip circuit for protection of solid state components from transients and from possible communication failure, by sensing the fault and by momentarily inhibiting firing of pulses.
    - System should **not** switch on during NO WATER conditions.
i. Other design features:
    - Load matching with a wide range of load conditions
    - Smooth ramp up of power for minimum inrush currents on start up at any pre-selected output power 100%
    - A trip circuit should protect the solid state components from transients and possible inverter commutation failure & to minimise nuisance intermittent tripping.
    - Frequent start-stop at 100% power to be harmless to the equivalent.
    - Provisions for limits of inverter and coil volts, power, frequency, impedance.
    - Low loss tank capacitors for power factor compensation of the load.
    - Precise power setting and repeatability: ±1% accuracy with ±10% line voltage variation.

j. Control panel shall have:
    - One set of push button for switching the generator ON/OFF
    - Control pot to manually select the desired operating power level through a potentiometer.
    - Control voltage transformer of adequate rating.
    - A set of indicating lamps for monitoring of the operating parameters.
    - A water distribution system consisting of inlet manifold, shut off valves, thermal warning devices for individual water branches & differential pressure switch connected between inlet and outlet manifolds.

k. The front panel should also have digital energy meter and pyrometer (Range of pyrometer: 500 to 1600°C).

l. Two nos of induction heating coil with following specification:

No. of turns: 8
Height: 160mm
Length: 5440 mm
Coil Crossection: 12mm
ID/OD: 220mm/242 mm

m. Coil should be installed inside glove box while power supply should be installed outside.
n. 2 sets of induction feedthrough for glove box.
o. Necessary copper pipe, electrical cable, waterline, etc for the installation is part of supply.

Other Specifications:

1) The supplier should have working staff holding police verification certificate, for the supply and installations at user site.

2) Free on-site Guarantee for 12 months must be provided by the suppliers.

3) The work involves installation, commissioning and integration of above said items inside radioactive laboratory, therefore it will be responsibility of the supplier to obtain necessary clearances for his workers/labourers to work inside BARC premises.

Information along with Technical offer:

(i) The bidder shall indicate in detail the standards adopted for the materials and processes and the quality control procedure followed by them.
(ii) Time required for manufacture, delivery and installation in the event of order placement.

Without above detailed information offer will be considered incomplete and will be liable to get rejected.

- You shall send your offer in a sealed envelope (by speed post or registered post only) indicating delivery period, price inclusive of taxes and other relevant information, to:

  D.Kohli
  Metallic Fuels Division
  Bhabha Atomic Research Centre
  Trombay,
  Mumbai 400 085

- Quotation shall reach us on or before **15/11/2017** before **11.30 hrs.**
- Please send "REGRET" if not quoting.
- On top left corner of the sealed envelope please indicate

  Design, Fabrication, supply, installation, Commissioning and guarantee of Induction Power Supply for High Temperature Application as Per Annexure-I -All applicable taxes should be clearly mentioned.
- Overwriting, scratching etc. must be avoided in the quotation. Rewriting the whole figure shall carry out any alteration in the figure. The authorized person from the firm shall countersign such figure.

- The delivery period mentioned in the quotation shall be strictly adhered to. If the contractor fails to supply and secure extension of delivery date before effecting delivery of the supply against the contract, acceptance of such item by the purchaser will in no way prejudice the right of the purchaser to levy liquidated damage nor will it be entitled to the contractor for payment of statutory levies that comes into force after the expiry of the delivery date.
- Early delivery schedule will be given a consideration.
- You may contact D.Kohli (25593929) for any clarification.

PLACE OF DELIVERY:

- The inspected and accepted assemblies shall be delivered to:

  Stores Officer
  Radiological Zonal Stores
  Bhabha Atomic research centre
  BOMBAY 400 085

INSPEPCTION AND TESTING:

The purchaser will have access at all reasonable times to all shops of the contractor and the sub-contractors where material is being fabricated and assembled and all reasonable facilities for such inspection shall be provided. Prior to the supply of item the manufacture has to get it approved from the purchaser.

PAYMENT TERMS:

Full payment will be made only after the satisfactory completion of Work order and delivery of **"Design, Fabrication, supply, installation, Commissioning and guarantee of Induction Power Supply for High Temperature Application as Per Annexure-I.**". Please note that income tax @ 2% will be deducted from your bill. ***No part payment or advance payment will be made.*** For this mode of payment, you are required to draw your invoice in the name of Director, Nuclear Fuels Group, Bhabha Atomic Research Centre, Mumbai 400085, in **triplicate along** with Advance Stamp receipt and to be submitted along with **"Design, Fabrication, supply, installation, Commissioning and guarantee of Induction Power Supply for High Temperature Application as Per Annexure-I"**

Company's PAN No. should be furnished along with the bill.

- **Company's copy of Sales Tax /Service Tax Registration Certificate has also to be furnished along with the bill.**

DELAY CLAUSE:

Any delay which is attributable to the contractor is liable for penalty @0.5% per week (max. 5%) to be imposed on the contractor.

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 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, adviser or the employees engaged by the contractor shall not use BARC's name for any publicity purpose through any public medial like press, radio, T.V. or Internet without the prior written approval of BARC.

(D.Kohli)
SO/D, MFD