SPECIFICATION & TECHNICAL DETAILS
OF LIQUID NITROGEN

1.0 Qualifying criteria - The tender of only those parties shall be accepted who meet the following qualifying conditions:

1.1 Have at least three years continuous experience in manufacturing and bulk supply of liquid nitrogen for industrial use, and the same running successfully at present.

1.2 Have sufficient back up facility for gas supply in case of breakdown in manufacturing plant/equipment.

2.0 Technical Specification

2.1 Liquid Nitrogen after vaporization shall conform to IS:1747 with 99.95% (min.) purity and moisture content less than 50 ppm (V/V).

2.2 Quantity : 600 in one year

2.3 Consumption per day : Upto 3000 m³ (3.4 MT) as per requirement with max. flow rate of 500 m³/hr in morning hours.

2.4 Min. stock to be maintained in storage tanks by supplier: 7000 m³ (8.0 MT) (If stock is below this level for two consecutive days then penalty of 0.5% per day (max. 10%) of that months’ bill will be imposed from 3rd day for no. of days the level is low).

3.0 Quality & Inspection

3.1 Normally inspection of material will be done at our works however BHEL may inspect material at source also.

3.2 The quality/purity test certificate shall be sent with every tanker.

4.0 Price variation clause

4.1 The price variation due to change in rates of electricity & diesel shall be allowed as given below (no other factor will be considered):

(a) Price variation with change in electricity rates:

\[ P_n = P_i + \left( (E_n - E_i) \times 0.88 \right) \]

\( P_i \) & \( P_n \) = Initial & new price of liquid Nitrogen (Rs/kg)

\( E_i \) & \( E_n \) = Initial & new electricity rate (Rs/unit)

(b) Price variation with change in diesel rates shall be as per below formula:

\[ T_n = T_i + \left( \frac{(D_n - D_i) \times T_i}{D_i} \right) \]

\( T_i \) & \( T_n \) = Initial & new transportation charges (Rs/kg)

\( D_i \) & \( D_n \) = Initial & new diesel rate (Rs/lit.)

4.2 (a) The PVC shall be applicable and price variation with change in electricity and diesel rates will be allowed as & when the rates are changed.

(b) The base rates of electricity and diesel must be given in offer.

(c) The electricity rate means the official electricity tariff, including all applicable fuel surcharges and electricity duty, as published by the relevant State Electricity Board and/or Regulatory Commission. The rate of diesel means price in Rs/lit. as declared by IOCL/HPCL/BPCL.
5.0 Transportation

5.1 The transportation of liquid nitrogen and its unloading in storage tank at our site shall be in supplier's scope.

5.2 Road tanker carrying liquid nitrogen should be approved for the purpose and before entry in BHEL, it should be complete with all safety and other necessary fittings as per CCoE and other statutory norms. It must carry TREM card and MSDS.

5.3 Supplier shall ensure compliance of the requirements as per Motor Vehicles Act 1988.

6.0 Delivery

6.1 Delivery of liquid nitrogen shall start immediately with commissioning of the storage system. Further delivery will vary as per actual use (estimated 50 MT±30% per month). An advance intimation of 2 days will be given by BHEL for supply.

SPECIFICATION & TECHNICAL DETAILS
FOR LIQUID NITROGEN STORAGE SYSTEM

1.0 Qualifying criteria
The tender of only those parties shall be accepted who have atleast three years experience in supply & installation of liquid nitrogen storage system for industrial use and those storage systems running successfully at present.

2.0 Technical Specification

2.1 Liquid storage capacity : 20 kL (minimum)

2.2 Gas pressure & flow required at : 14 bar @500 m3/hr for direct supply through Pipeline.

3.0 Storage system

3.1 The liquid nitrogen system should be complete from liquid inlet to gas outlet conforming to all technical and statutory requirements.

3.2 Loading, unloading, erection & commissioning of tanks, vaporizers, related equipment and interconnecting pipelines upto vaporizers outlet flange and all other required material, mobile cranes etc. and other resources are in bidder's scope. Only civil work and water/power supply at one point shall be in BHEL's scope.

3.3 Erection & commissioning of complete storage system should be done within 6 weeks from the date of completion of civil foundation by BHEL, intimated to supplier. The supplier must furnish the necessary civil drawings within 10 days of issue of LoI/PO.

3.4 The system should be in well maintained condition and approved for intended use by concerned authorities. The documents showing relevant approvals, year of manufacture and other details should be furnished before installation.

3.5 The supplier has to submit necessary technical/civil drawings and schematic drawing of all equipment with offer, clearly showing the required area and layout.

3.6 All the work/procedures necessary for compliance of statutory requirements related to storage tank and accessories shall be in supplier's scope.

3.7 Since the storage license is in BHEL's name, the documents related to above with compliance must be furnished to us within stipulated time. If supplier fails to do so, BHEL reserves the right to complete the work/procedures for statutory/safety compliances and deduct the expenses incurred by BHEL from supplier's bill.

3.8 If any penalty is imposed by statutory authorities due to non compliance on supplier's part, the same shall be recovered from supplier's bills.
3.9 The maintenance of storage system shall be in supplier’s scope. In case of any problem in storage system, it shall be attended immediately on intimation by us.

4.0 Transportation

The transportation of complete storage system from suppliers’ works to our site and taking back after contract expiry, arrangement of mobile cranes and all resources for loading/unloading shall be in bidder’s scope and no extra charges will be paid.

5.0 Price variation clause

The price variation shall not be allowed in rental charges.