ENQUIRY (INDIGENOUS)

BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

PHONE :2577152
GRAMS : BHARATELEC
FAX NO: 2520193
E-mail: ssraj@bheltry.co.in
Web:

429-002/A

Enquiry No	Enquiry Date	Due Date for Quotation
2801200014 - CCDP	21.03.2012	24.04.2012

Please quote Enquiry No, Date and due date in all correspondences.
This is only a request for quotation and not an order

Item	Description	Unit	Quantity	Delivery Schedule Quantity	Delivery Schedule Date
10	2"Pneumatically operated ball valve with accessories As per specification attached 2" Ball Valve	NO	6.000	6.00	30.06.12
20	4"Pneumatically operated Ball valve With Accessories As per Specification Attached 4" Ball Valve	NO	4.000	4.00	30.06.12
30	8" Pneumatically operated Ball valve with accessories As per Specification Attached 8" Ball valve	NO	2.000	2.00	30.06.12
40	10" pneumatically operated ball valve with accessories As per Specification attached 10' ball Valve	NO	2.000	2.00	31.07.12
50	16" Pneumamatically operated Ball Valve with accessories As per Specification attached 16" Ball valve	NO	1.000	1.00	30.06.12

General Note:

1) OFFER WILL BE INVITED IN TWO PART BID ONLY (SUBMITTED IN TWO COVERS - TECHNICAL BID AND PRICE BID);
2) IF REGRETTED MAKE MENTION ON THE TOP OF THE REPLY COVER AS "REGRETTED";
3) LD CLAUSE HAS TO BE CONFIRMED WITHOUT FAIL. OTHERWISE WE WOULD ASSUME THAT YOU HAVE ACCEPTED OUR LD CLAUSE;
4) REQUIRED : a) TEST CERTIFICATE, b) ~~TEST CERTIFICATE~~ GUARANTEE CERTIFICATE;
5) THE PREFERRED PAYMENT TERM IS "100% PAYMENT AFTER RECEIPT AND ACCEPTANCE OF MATERIAL", OR "100% LETTER OF CREDIT";
6) ADVANCE OR PROFORMA INVOICE PAYMENT IS NOT ACCEPTED;
7) TRANSPORT AND DELIVERY AT BHEL / SHALL BE VENDOR'S SCOPE;
8) TENDER SPECIFICATIONS FOR ALL THE ABOVE SIZES PNEUMATICALLY OPERTATED BALL VALVES IS ENCLOSED;

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

S. Subburaj
Deputy Manager / R&D and CR
Bharat Heavy Electricals Limited
Coal Research Centre Building
Tiruchirapalli - 620 014.

MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,

BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
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2801200014 / 21.03.2012

9) ALL CLARIFICATIONS MAY SOUGHT ATLEAST SEVEN DAYS FROM THE TENDER DUE DATE FROM THE UNDERSIGNED WITH DUE WRITTEN REQUEST;
10) IF THE DUE DATE OF TENDER OPENING HAPPEN TO BE HOLIDAY THE TENDER WILL BE OPENED ON THE NEXT WORKING DAY;
11) TENDER DETAILS ALSO HOSTED IN BHEL WEB -
" www.bhel.com "

Enclosures:

"LD clause has to be confirmed without fail."
"Payment to vendors will be made only thro E-Payment mode"

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

S. Subburaj
Deputy Manager / R&D and CR
Bharat Heavy Electricals Limited
Coal Research Centre Building
Tiruchirapalli - 620 014.

MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,

BHARAT HEAVY ELECTRICALS LIMITED
R&D / PURCHASE
TIRUCHIRAPALLI - 620 014.

PURCHASE ENQUIRY - TERMS & CONDITIONS

1. a) QUOTATIONS: Each tender should be sent in double cover, inner cover should be sealed with tenderer's distinctive seal and super scribed with correct tender No. item of supply and due of opening. The outer should only bear the address of this office and should not have any indication that a tender is within. Two or more quotation should not be sent in one cover but the quotation against each tender should be sent separately to avoid confusion. Tender should not be addressed to any individual's name but only by designation.

   b) Tender should be free from CORRECTION AND ERASURES. Correction if any, must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words prevail.

   c) PRICE should be nett F.O.R dispatching station inclusive of risk in transit and remain valid for 60 days from the due date.

   d) If any Sales Tax is payable as extra to the quoted price it should be specifically stated in quotations alongwith CST & TNGST No. failing which the purchaser will not be liable for payment of Sales Tax. Our T.N.G.ST. No. 256005, Dated 01-04-1995, C.S.T. No. 219383, Dated 11-06-1991.

   e) NO REVISION OF PRICES will be entertained after tenders are opened.

   f) Manufacturer's Name, Trade Mark or Patent No. if any should be specified. Illustrative leaflets giving technical particulars are required along with quotation wherever necessary.

   g) Products with I.S.I. certification marks will be preferred.

   h) The purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reason whatsoever.

2. SAMPLES: Wherever possible, sample should be submitted separately whether specifically requested or not so as to reach the purchaser on or before the due date of the enquiry. They should be clearly marked with the Enquiry No. and the date on the outside cover to facilitate identification.

3. PACKING AND MARKING: The supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.

4. TERMS OF PAYMENT: Payment will be made within 45 days of satisfactory receipt of materials at site. Wherever required by the purchaser, the successful tenderer must send the operation and maintenance manuals, Test certificates, Drawings, etc., for the materials ordered. These should be sent immediately after dispatch of the materials and a statement to that effect should be made in the invoice. Failure to comply with this provision will result in delay in payment of the Bills. Goods dispatched either by V.P.P. or by the document presented through bank will be accepted unless agreed to by the Purchaser.

   The duplicate copy of the invoice meant for the transporters should accompany the material as stipulated under C.E. Rules 52-A and 173-C (or) SFGG. A Photostat copy of the above invoice for each delivery challan should be submitted alongwith the original bills router through Bank or submitted directly to BHEL Finance Department.

5. SECURITY DEPOSIT: For purchase over Rs. 5000/-the successful tenderers may be requested to furnish a BANK GUARANTEE / SECURITY DEPOSIT for an appropriate value as may be determined by BHEL.

6. LIQUIDATED DAMAGES / PENALTY AND INTEREST ON ADVANCEES FOR DELAY IN DELIVERY: "If the supplier fails to deliver the raw material / Equipment / Components within the period specified in the contract the purchaser shall deduct LIQUIDATED DAMAGES a sum equivalent to 0.5% of the Price for each week of delay upto a maximum of 15% of the price of the delayed / undelivered goods. In addition to the recovery of interest at normal cash credit rate plus 2% for the unadjusted portion of the advances. If the delay in delivery of a part contributes to delay in execution of total system, LD and interest on advances will be recovered on the total contract price / total advance paid".

7. RISK PURCHASE: Alternatively the purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefore. The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned in clause 6 above.

8. PREFERENTIAL DELIVERY: It should be noted if a contract is placed on a higher tenderer as results of this invitation to tender in preference to the lowest acceptable offer in consideration of the earlier delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price F.O.R. DESTINATION, including of all elements of Frights, Sales Tax, Duties and other incidents, incidental in case of failure to complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.

9. MODVAT CREDIT: If any Excise Duty is payable, the chapter Head / Sub-Head reference and the rate of the duty should be quoted. If the tender is availing MODVAT credit for his input materials, the effect of Proforma credit should be passed on to the purchaser. Tenderer under "MODVAT" shall be preferred.

10. GENERAL: The purchaser reserves the right to split up the tender and place order for individual items with different tenderers and also increase or decrease the quantity.

Any other Conditions which might have been quoted by the Seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in by Purchaser will not be applicable to the Contact.

BHARAT HEAVY ELECTRICALS LIMITED

R&D

TIRUCHIRAPALLI – 620 014.

MATERIAL MANAGEMENT DEPARTMENT

ANNEXURE TO PURCHASE ENQUIRY

Please ensure that the following details are incorporated in your **Offer**.

1.	PRICE	:	**Ex-Works / Ex-Godown** **(or) F.O.R. – DESTINATION**
2.	DISCOUNT	:	**% (or) Lumpsum amount – Rs.....**
3.	PACKING & FORWARDING	:	**% (or) Lumpsum amount – Rs.....**
4.	TAX	:	**TNGST % / CST %** **without concession and with concession** **(since, we are not eligible for Form-C please, FULL TAX may be mentioned)** **(Rates of applicable Taxes & Duties and whether inclusive or exclusive should also be mentioned)**
5.	SURCHARGE	:	%
6.	DUTIES	:	%
7.	FREIGHT & INSURANCE	:	%
8.	DELIVERY PLACE	:	
9.	DELIVERY PERIOD	:	
10.	LD / PENALTY FOR DELAY IN DELIVERY	:	@ 0.5% PER WEEK SUBJECT TO A MAXIMUM OF 15% IS APPLICABLE. CONFIRM YOUR ACCEPTANCE.
11.	OFFER VALIDITY	:	
12.	PAYMENT TERMS	:	**BHEL Payment terms are –** **1) 90% Payment through Bank against proof of despatch documents. Balance 10% after receipt and acceptance of materials.** **2) 100% payment within 45 days after Receipt and Acceptance of Material.**
13.	GUARANTEE / TEST CERTIFICATE	:	

SIGNATURE OF SUPPLIER WITH SEAL

NOTE : Please do not Quote as EXTRA.
Quote the Rate in % / The Amount in Rupees.

BHEL, Trichy–14
R&D and CR – Purchase Department

SPECIFICATION OF METAL SEATED 2” BALL VALVE

Scope of supply	:	To supply 2’’ metal seated ball valve with **chromium carbide or Nickel Boron** coated ball and seat and accessories as per the following specification. **The above supply is with 2 part bid, ie first technical bid followed by commercial (price) bid.**
1. Ball valve type	:	High temperature, fire safe, full bore, 2 piece design, metal seated, bi directional sealing, pneumatic operated ball valve with Pneumatic actuator. Ball and seats to be matched sets and interchangeable for valves of the same bore size. Seats must be field replaceable. Floating / Trunnion (Advantages for selection to be specified)
2. Pressure rating	:	ANSI Class # 300, (Temperature 600 ° C)
3. End connection	:	Flanged, Raised Face with serrated finish as per ANSI B 16.5.
4. Face to Face	:	As per ANSI B 16.10 (long pattern) Stem extension to take care of high temperature.
5. Bore Size	:	Full bore to 2” size.
6. Body	:	ASTM A 351 Gr CF8M
7. Body fasteners	:	Suitable Stainless Steel material grade
8. Body Gasket		Graphite filled spiral wound gasket or equivalent gasket to withstand high temperature.
9. Ball	:	ASTM A351 Gr CF8M fully spherical ball with **Chromium Carbide** or **Nickel Boron** Coating. The coating thickness, hardness value and process are to be specified.
10. Seat	:	ASTM A351 Gr CF8M type with **Chromium Carbide** or **Nickel Boron C**oating. The coating thickness, hardness and process are to be specified. Hardness value to be specified by supplier
11. Stem	:	A638 GR 660 or equivalent

12. Stem Packing : Graphoil based packing

13. Leakage rating : Class VI as per FCI-70-2-2006.

14. Testing : As per standard for shell hydro, seat hydro and seat pneumatic tests. Supplier to specify the standard.
Testing at Shut off condition, Valve to be subjected to the differential pressure of 3 to 14 bar on both sides with air as testing medium.

15. Mounting of the valve : **Vertical / Horizontal / Inclined direction**

16. Condition of application

(a) Valve operation : The valve should be suitable for 100 cycles of remote control ON/OFF operation per day, open or close within a minute. Supplier to specify the open/close time.

(b) Material of handling : The valve is used to handle gas with fly ash / coal fines at 14 Kg / cm^2 (g) pressure and at 600 ° C temperature.

A) Typical Gas composition : % by weight

12 % CO_2: 16%CO :12% H_2:

2% CH_4: 1% O_2: 57% N_2 and trace level of H_2S.

B) Characteristics of ash

i) Size distribution:

+ 300 Micron	– 9 to 11 %
+ 150 Micron	– 16 to 6 %
+ 75 Micron	– 25 to 8 %
– 75 Micron	– 50 to 75 %
ii) Bulk density	– 1300 Kg /m^3
iii) Particle density	– 2600 Kg/m^3
iv) Nature	– **Abrasive and erosive**

v) Chemical composition:

60 % $Si0_2$: 27 % $A1_2O_3$: 8% Fe_2O_3:5%CaO&MgO:

Trace level of Na_2O & K_2O.

17. Heavy duty Pneumatic Actuator : Suitable pneumatic, Quarter turn, double acting, air to open, air to close, air fail to stay put, and power fail to

close, opening and closing within a minute, with open or close indication for remotely controlled ON - OFF application, to work for pneumatic pressure of 4 Kg / cm^2 (57 PSI), with higher torque actuator in order to take care of the specified application. Preferred actuator torque value would be double that of the value.

Torque values of valve (opening, closing, running) as well as that of actuator should be provided.

Instrument Air pressure Min- 4 Kg/cm^2. For extended shaft, spool piece to be provided to accommodate the actuator suitably.

18. Solenoid valve : ASCO Make (model AEB 342 C1 with ¼" pneumatic tubing) continuous duty, explosion proof, Gr. II A, II B, flame proof for ON – OFF application to operate on min 4 Kg / cm^2 (g) (57 PSI) pneumatic pressure solenoid valve rating is 110V ± 10% and 50 HZ. When the solenoid valve is energized, the ball valve should open and when de-energized or during power failure the ball valve should close. 100 cycles of ON-OFF operation per day is envisaged. ½" NPT cable entry & with suitable double compression gland and ceramic filters for unused ports to be provided.

19. Position feed back limit switch : Explosion proof, Gr.IIA, II B, dust and water proof type IP66 having DPDT with silver plated contact of rating 125 V DC, 0.5 Amps. Preferably "Honey well" make 21CX 16 model. Junction box provided should also confirm to explosion, dust and water proofs. ½'' NPT cable entry & with suitable double compression gland to be provided.

20. Air Filter Regulator : Air filter regulator with manual drain facility with port size ¼ '' NPT (F) Filter range 5 to 25 Microns. Mounted with output gauge (0 to 10 bar).

21. Mounting and Tubing : The Actuator should be mounted on the Ball Valve with proper strong mounting bracket. Solenoid valve and filter regulator should be tubed to the actuator. Tubing should be 6mm OD in SS with double ferrule. Limit switches are directly mounted on the actuator and held by a bracket mounting as per standards.

22. Special instructions:

1. The valve with its accessories should be guaranteed for trouble free operation for a period of 18 months from the date of supply or 12 months from the date of commissioning
2. Vendor to submit drawings and quality plan to BHEL, within a month after Purchase Order, for approval. General arrangement drawing of ball valve with actuator mounting in position to be submitted for approval. Manufacturing of the valve will start only after obtaining the drawing approved from CCDP / BHEL
3. The following are also to be provided at appropriate time:-
    a. Test certificates (TCs) for the material of construction of valve body, ball, seat , stem, etc.,
    b. Test certificates for pressure hydro test of the valve body, for hydro and pneumatic seat leakage rate tests,
    c. Explosion proof, flame proof and dust proof certificates for accessories,
    d. Relevant catalogues viz. quick exhaust valve, actuator type limit switch, solenoid valve etc.,
    e. Relevant standard Numbers for Design, manufacturing and testing,
    f. O&M instruction manual containing assembly / disassembly procedure,
    g. **Spare parts list, supplier to quote for ball & seat with packings, actuator spares separately with other required spares**
    h. Dimensional & Cross sectional drawing of the valve,

i. Dimensional clearance between ball & body seat,
j. Sliding friction coefficient between ball and seat,
k. Surface finish for both ball and seat prior to coating,
l. QAP & QCP along with the schedule,

4. Inspection will be carried out by CCDP / BHEL / Trichy and testing as per point No.14 will be carried out by the supplier in the presence of CCDP / BHEL personnel.
5. Valve marking symbols, abbreviations etc., shall be in accordance with MSS – SP – 25 or relevant standard. Vendors name, valve rating, material designation, nominal size, direction of flow etc, shall be integral on the body. A corrosion resistant tag giving size, tag / code No. etc is to be securely attached on the valve body. Direction of opening/closing should also be given.
6. Valve is to be dry, clean and free from moisture, dirt and loose foreign materials of any kind and protected from rust, corrosion and any mechanical damage during transportation, shipment and storage. Suitable end protectors can be used for each end of valve flange for protection.
7. Packing and forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage.
8. The supplier to suggest the procedure along with required spares for repair/maintenance when the valve starts passing
9. The supplier to include quotation for AMC of ball valve after the guarantee period.
10. BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected.
11. Vendor to have supplied equivalent ball valves for similar application:
    a. Name and postal address of the customer or company
    b. Name and designation of the contact person of the customer
    c. Phone Fax no and email address of the contact person of the customer
    d. Month and year of commissioning of the system and no. of hours of operation.
    e. Application for which the system is supplied.
    f. Performance certificate from the customers regarding satisfactory performance of the system supplied to them.
12. Incomplete offers or offers not meeting the above requirement will not be considered for evaluation

Technical Specification – Supplier to fill all columns

S.No	Technical Specification & BHEL requirement	Supplier:		
		Offer No:	Dt.	
		Supplier Offer	Deviation	Remarks
1	Scope: To supply 2'' size Nickel Boron or Chromium Carbide Coated Ball & Seat, Ball Valve with accessories. Pneumatic Actuator, Air Pressure Regulator, Moisture Trap ,Open/Close indicator Solenoid Valve, Position Feedback Limit Switch and other additional points.			
2	Application: Ball Valve with accessories:(a) Suitablefor100 cycles per day of remote control ON/ OFF operation			
	(b) Suitable for handling materials at 14 Kg/cm^2 (g) pressure & 600° C temp (Ref Annexure for handling material)			
3	Valve Model No			
4	Type: a)Pressure ANSI Class: **#300** Bi-Directional Valve			
	b)Leakage rate:FCI-70-2-2006- **Class VI**			
	c)Fire safe			
	d)Full bore to the size 2"			
	e)2 piece body design			
	f)Fully spherical ball			
	g)Metal seated/seat supported			
	h)Floating /Trunnion			
	i)Pneumatically operated			
5	End connection: Flanged RF to ANSI B 16.5 with serrated finish.			
6	Face to Face: ANSI B 16.10 (long pattern)			

7	Body Material : ASTM A 351Gr CF8M. Valve body std–ASME B16.34. Purge provision on body using N2 or coal gas as purge medium. Supplier to indicate the purge gas pressure.			
8	Body fasteners: Suitable SS High temperature material			
9	Ball: ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
10	Seat:ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
11	Stem: A638 Gr 660 or equivalent			
12	Body Seal: Grafoil /Suitable seal arrangement to withstand high pressure and high temp.			
13	Stem Seal: Grafoil/ suitable seal arrangement to withstand high pressure and high temp.			
14	Mounting of the valve:: Field mounting of ball valve: Suitable to mount in vertical/ horizontal /inclined pipeline.			
15	Heavy duty Pneumatic Actuator:			
	a) Make and Model			
	b)Pneumatic			
	c)Double acting			
	d)Air fail to stay put			
	e)Power fail to close			
	f) For remote control 100 cycles ON/OFF operation per day			
	g)To work for minimum 4 $Kg/cm^2(g)$(57psig) pneumatic pressure			
	h) With air pressure regulator			
	i) With open/close indicator.			

	j)Opening/Closing duration			
	l) Actuator to be selected considering higher resistance offered by ash to valve operation at application conditions. Service factor / capacity of the actuator to be indicated.			
	m) Supplier is to provide the opening, running and closing torque value of the ball valve in Nm			
16	Solenoid valve:			
	a) Make and Model -ASCO Make, AEB342 C3 or Equivalent.			
	b) Rating110V+/- 10%, 50 HZ			
	c) Explosion proof (Gr.IIA, II B)			
	d) Flame proof			
	e) 3/8 ” pneumatic tubing			
	f) For 100 cycles ON/OFF operation per day			
	g) To work for min 4 $Kg/cm^2(g)$ (57 PSI) inst.air pr			
	h) When the solenoid valve is energized, the ball valve should open and when the solenoid valve is de-energized or during power failure the ball valve should close.			
	i) With ½” NPT Cable entry & cable gland			

	j) With double compression gland, & ceramic filters for unused ports.			
17	Position Feedback Limit Switch:			
	a)Make and Model- Honey well 21CX16 preferred			
	b)Rating 125V DC, 0.5 amp			
	c) Explosion proof, Gr.IIA, II B			
	d)Dust and water proof type			
	e)DPDT with silver plated contact			
	f)Flame proof and explosion proof and water proof junction box			
	g) With ½" NPT Cable entry			
	h)With double compression gland			
18	Mounting Assembly: Actuator mounted on the ball valve with bracket and adaptor; open/close indicator & limit switch mounted on the actuator with bracket			
19	Testing: a) Hydrostatic Shell Test-Supplier to specify			
	b) Seat leak tests as per FCI-70-2-2006- **Class VI**			
20	Inspection: a)100% inspection of valves with all accessories by CCDP/ BHEL/Trichy;			
	b) Tests are to be carried out for valves assembled with all accessories by the supplier in the presence of CCDP / BHEL/Trichy personnel and dispatch after clearance by CCDP / BHEL/Trichy.			

	c)All relevant Test Certificates(TCs) for the material of valve body, ball, seat, stem, etc to be submitted			
	d) All relevant Test Certificates (TCs) for explosion proof, flame proof and dust proof certificates for accessories to be submitted.			
21	Drawing: Manufacturing as per drawing approved by CCDP/BHEL/Trichy.			
22	QCP: Supplier is to submit quality control procedure & get it approved by CCDP/BHEL/Trichy.			
23	Valve painting as per standard practice			
24	Valve markings as per standard practice			
25	Packing and Forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage			
26	Guarantee/Warranty: Supplier is to give guarantee/warranty for 12 months from commissioning date or 18 months from dispatch date whichever is earlier			
27	Spares: supplier is to specify the spares for 2 years operation including instrumentation items. Ball & Seat with Packings & Actuator spares			
28	Manual: Supplier is to submit the O&M manual at appropriate time. Six hard copies & a soft copy			

29	Along with Technical Offer supplier is to submit all relevant catalogues and drawings for evaluation. . Supplier to submit the references list applicable to high pressure, high temp and erosive nature in particular gasification plant (Separate sheet may be attached).			

BHEL, Trichy–14
R&D and CR – Purchase Department

SPECIFICATION OF METAL SEATED 4" BALL VALVE

Scope of supply	:	To supply 4'' metal seated ball valve with **chromium carbide or Nickel Boron** coated ball and seat and accessories as per the following specification. **The above supply is with 2 part bid, ie first technical bid followed by commercial (price) bid.**
1. Ball valve type	:	High temperature, fire safe, full bore, 2 piece design, metal seated, bi directional sealing, pneumatic operated ball valve with Pneumatic actuator. Ball and seats to be matched sets and interchangeable for valves of the same bore size. Seats must be field replaceable. Floating / Trunnion (Advantages for selection to be specified)
2. Pressure rating	:	ANSI Class # 300, (Temperature 600 ° C)
3. End connection	:	Flanged, Raised Face with serrated finish as per ANSI B 16.5.
4. Face to Face	:	As per ANSI B 16.10 (long pattern) Stem extension to take care of high temperature.
5. Bore Size	:	Full bore to 4" size.
6. Body	:	ASTM A 351 Gr CF8M
7. Body fasteners	:	Suitable Stainless Steel material grade
8. Body Gasket		Graphite filled spiral wound gasket or equivalent gasket to withstand high temperature.
9. Ball	:	ASTM A351 Gr CF8M fully spherical ball with **Chromium Carbide** or **Nickel Boron** Coating. The coating thickness, hardness value and process are to be specified.
10. Seat	:	ASTM A351 Gr CF8M type with **Chromium Carbide** or **Nickel Boron C**oating. The coating thickness, hardness and process are to be specified. Hardness value to be specified by supplier
11. Stem	:	A638 GR 660 or equivalent

12. Stem Packing : Graphoil based packing

13. Leakage rating : Class VI as per FCI-70-2-2006.

14. Testing : As per standard for shell hydro, seat hydro and seat pneumatic tests. Supplier to specify the standard.
Testing at Shut off condition, Valve to be subjected to the differential pressure of 3 to 14 bar on both sides with air as testing medium.

15. Mounting of the valve : **Vertical / Horizontal / Inclined direction**

16. Condition of application

(a) Valve operation : The valve should be suitable for 100 cycles of remote control ON/OFF operation per day, open or close within a minute. Supplier to specify the open/close time.

(b) Material of handling : The valve is used to handle gas with fly ash / coal fines at 14 Kg / cm^2 (g) pressure and at 600 ° C temperature.

A) Typical Gas composition : % by weight

12 % CO_2: 16%CO :12% H_2:

2% CH_4: 1% O_2: 57% N_2 and trace level of H_2S.

B) Characteristics of ash

i) Size distribution:

+ 300 Micron	– 9 to 11 %
+ 150 Micron	– 16 to 6 %
+ 75 Micron	– 25 to 8 %
– 75 Micron	– 50 to 75 %
ii) Bulk density	– 1300 Kg /m^3
iii) Particle density	– 2600 Kg/m^3
iv) Nature	– **Abrasive and erosive**

v) Chemical composition:

60 % $Si0_2$: 27 % $A1_2O_3$: 8% Fe_2O_3:5%CaO&MgO:

Trace level of Na_2O & K_2O.

17. Heavy duty Pneumatic Actuator : Suitable pneumatic, Quarter turn, double acting, air to open, air to close, air fail to stay put, and power fail to

close, opening and closing within a minute, with open or close indication for remotely controlled ON - OFF application, to work for pneumatic pressure of 4 Kg / cm^2 (57 PSI), with higher torque actuator in order to take care of the specified application. Preferred actuator torque value would be double that of the value.

Torque values of valve (opening, closing, running) as well as that of actuator should be provided.

Instrument Air pressure Min- 4 Kg/cm^2. For extended shaft, spool piece to be provided to accommodate the actuator suitably.

18. Solenoid valve : ASCO Make (model AEB 342 C1 with ¼" pneumatic tubing) continuous duty, explosion proof, Gr. II A, II B, flame proof for ON – OFF application to operate on min 4 Kg / cm^2 (g) (57 PSI) pneumatic pressure solenoid valve rating is 110V ± 10% and 50 HZ. When the solenoid valve is energized, the ball valve should open and when de-energized or during power failure the ball valve should close. 100 cycles of ON-OFF operation per day is envisaged. ½" NPT cable entry & with suitable double compression gland and ceramic filters for unused ports to be provided.

19. Position feed back limit switch : Explosion proof, Gr.IIA, II B, dust and water proof type IP66 having DPDT with silver plated contact of rating 125 V DC, 0.5 Amps. Preferably "Honey well" make 21CX 16 model. Junction box provided should also confirm to explosion, dust and water proofs. ½'' NPT cable entry & with suitable double compression gland to be provided.

20. Air Filter Regulator : Air filter regulator with manual drain facility with port size ¼ '' NPT (F) Filter range 5 to 25 Microns. Mounted with output gauge (0 to 10 bar).

21. Mounting and Tubing : The Actuator should be mounted on the Ball Valve with proper strong mounting bracket. Solenoid valve and filter regulator should be tubed to the actuator. Tubing should be 6mm OD in SS with double ferrule. Limit switches are directly mounted on the actuator and held by a bracket mounting as per standards.

22. Special instructions:

1. The valve with its accessories should be guaranteed for trouble free operation for a period of 18 months from the date of supply or 12 months from the date of commissioning
2. Vendor to submit drawings and quality plan to BHEL, within a month after Purchase Order, for approval. General arrangement drawing of ball valve with actuator mounting in position to be submitted for approval. Manufacturing of the valve will start only after obtaining the drawing approved from CCDP / BHEL
3. The following are also to be provided at appropriate time:-
    a. Test certificates (TCs) for the material of construction of valve body, ball, seat , stem, etc.,
    b. Test certificates for pressure hydro test of the valve body, for hydro and pneumatic seat leakage rate tests,
    c. Explosion proof, flame proof and dust proof certificates for accessories,
    d. Relevant catalogues viz. quick exhaust valve, actuator type limit switch, solenoid valve etc.,
    e. Relevant standard Numbers for Design, manufacturing and testing,
    f. O&M instruction manual containing assembly / disassembly procedure,
    g. **Spare parts list, supplier to quote for ball & seat with packings, actuator spares separately with other required spares**
    h. Dimensional & Cross sectional drawing of the valve,

i. Dimensional clearance between ball & body seat,
j. Sliding friction coefficient between ball and seat,
k. Surface finish for both ball and seat prior to coating,
l. QAP & QCP along with the schedule,

4. Inspection will be carried out by CCDP / BHEL / Trichy and testing as per point No.14 will be carried out by the supplier in the presence of CCDP / BHEL personnel.
5. Valve marking symbols, abbreviations etc., shall be in accordance with MSS – SP – 25 or relevant standard. Vendors name, valve rating, material designation, nominal size, direction of flow etc, shall be integral on the body. A corrosion resistant tag giving size, tag / code No. etc is to be securely attached on the valve body. Direction of opening/closing should also be given.
6. Valve is to be dry, clean and free from moisture, dirt and loose foreign materials of any kind and protected from rust, corrosion and any mechanical damage during transportation, shipment and storage. Suitable end protectors can be used for each end of valve flange for protection.
7. Packing and forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage.
8. The supplier to suggest the procedure along with required spares for repair/maintenance when the valve starts passing
9. The supplier to include quotation for AMC of ball valve after the guarantee period.
10. BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected.
11. Vendor to have supplied equivalent ball valves for similar application:
    a. Name and postal address of the customer or company
    b. Name and designation of the contact person of the customer
    c. Phone Fax no and email address of the contact person of the customer
    d. Month and year of commissioning of the system and no. of hours of operation.
    e. Application for which the system is supplied.
    f. Performance certificate from the customers regarding satisfactory performance of the system supplied to them.
12. Incomplete offers or offers not meeting the above requirement will not be considered for evaluation

Technical Specification – Supplier to fill all columns

S.No	Technical Specification & BHEL requirement	Supplier:		
		Offer No:	Dt.	
		Supplier Offer	Deviation	Remarks
1	Scope: To supply 4'' size Nickel Boron or Chromium Carbide Coated Ball & Seat, Ball Valve with accessories. Pneumatic Actuator, Air Pressure Regulator, Moisture Trap ,Open/Close indicator Solenoid Valve, Position Feedback Limit Switch and other additional points.			
2	Application: Ball Valve with accessories:(a) Suitablefor100 cycles per day of remote control ON/ OFF operation			
	(b) Suitable for handling materials at 14 Kg/cm^2 (g) pressure & 600° C temp (Ref Annexure for handling material)			
3	Valve Model No			
4	Type: a)Pressure ANSI Class: **#300** Bi-Directional Valve			
	b)Leakage rate:FCI-70-2-2006- **Class VI**			
	c)Fire safe			
	d)Full bore to the size 4"			
	e)2 piece body design			
	f)Fully spherical ball			
	g)Metal seated/seat supported			
	h)Floating /Trunnion			
	i)Pneumatically operated			
5	End connection: Flanged RF to ANSI B 16.5 with serrated finish.			
6	Face to Face: ANSI B 16.10 (long pattern)			

7	Body Material : ASTM A 351Gr CF8M. Valve body std–ASME B16.34. Purge provision on body using N2 or coal gas as purge medium. Supplier to indicate the purge gas pressure.			
8	Body fasteners: Suitable SS High temperature material			
9	Ball: ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
10	Seat:ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
11	Stem: A638 Gr 660 or equivalent			
12	Body Seal: Grafoil /Suitable seal arrangement to withstand high pressure and high temp.			
13	Stem Seal: Grafoil/ suitable seal arrangement to withstand high pressure and high temp.			
14	Mounting of the valve:: Field mounting of ball valve: Suitable to mount in vertical/ horizontal /inclined pipeline.			
15	Heavy duty Pneumatic Actuator:			
	a) Make and Model			
	b)Pneumatic			
	c)Double acting			
	d)Air fail to stay put			
	e)Power fail to close			
	f) For remote control 100 cycles ON/OFF operation per day			
	g)To work for minimum 4 $Kg/cm^2(g)$(57psig) pneumatic pressure			
	h) With air pressure regulator			
	i) With open/close indicator.			

	j)Opening/Closing duration			
	l) Actuator to be selected considering higher resistance offered by ash to valve operation at application conditions. Service factor / capacity of the actuator to be indicated.			
	m) Supplier is to provide the opening, running and closing torque value of the ball valve in Nm			
16	Solenoid valve:			
	a) Make and Model -ASCO Make, AEB342 C3 or Equivalent.			
	b) Rating110V+/- 10%, 50 HZ			
	c) Explosion proof (Gr.IIA, II B)			
	d) Flame proof			
	e) 3/8 ” pneumatic tubing			
	f) For 100 cycles ON/OFF operation per day			
	g) To work for min 4 $Kg/cm^2(g)$ (57 PSI) inst.air pr			
	h) When the solenoid valve is energized, the ball valve should open and when the solenoid valve is de-energized or during power failure the ball valve should close.			
	i) With ½” NPT Cable entry & cable gland			

	j) With double compression gland, & ceramic filters for unused ports.			
17	Position Feedback Limit Switch:			
	a)Make and Model- Honey well 21CX16 preferred			
	b)Rating 125V DC, 0.5 amp			
	c) Explosion proof, Gr.IIA, II B			
	d)Dust and water proof type			
	e)DPDT with silver plated contact			
	f)Flame proof and explosion proof and water proof junction box			
	g) With ½" NPT Cable entry			
	h)With double compression gland			
18	Mounting Assembly: Actuator mounted on the ball valve with bracket and adaptor; open/close indicator & limit switch mounted on the actuator with bracket			
19	Testing: a) Hydrostatic Shell Test-Supplier to specify			
	b) Seat leak tests as per FCI-70-2-2006- **Class VI**			
20	Inspection: a)100% inspection of valves with all accessories by CCDP/ BHEL/Trichy;			
	b) Tests are to be carried out for valves assembled with all accessories by the supplier in the presence of CCDP / BHEL/Trichy personnel and dispatch after clearance by CCDP / BHEL/Trichy.			

	c)All relevant Test Certificates(TCs) for the material of valve body, ball, seat, stem, etc to be submitted			
	d) All relevant Test Certificates (TCs) for explosion proof, flame proof and dust proof certificates for accessories to be submitted.			
21	Drawing: Manufacturing as per drawing approved by CCDP/BHEL/Trichy.			
22	QCP: Supplier is to submit quality control procedure & get it approved by CCDP/BHEL/Trichy.			
23	Valve painting as per standard practice			
24	Valve markings as per standard practice			
25	Packing and Forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage			
26	Guarantee/Warranty: Supplier is to give guarantee/warranty for 12 months from commissioning date or 18 months from dispatch date whichever is earlier			
27	Spares: supplier is to specify the spares for 2 years operation including instrumentation items. Ball & Seat with Packings & Actuator spares			
28	Manual: Supplier is to submit the O&M manual at appropriate time. Six hard copies & a soft copy			

29	Along with Technical Offer supplier is to submit all relevant catalogues and drawings for evaluation. . Supplier to submit the references list applicable to high pressure, high temp and erosive nature in particular gasification plant (Separate sheet may be attached).			

BHEL, Trichy–14
R&D and CR – Purchase Department

SPECIFICATION OF METAL SEATED 8" BALL VALVE

Scope of supply	:	To supply 8'' metal seated ball valve with **chromium carbide or Nickel Boron** coated ball and seat and accessories as per the following specification. **The above supply is with 2 part bid, ie first technical bid followed by commercial (price) bid.**
1. Ball valve type	:	High temperature, fire safe, full bore, 2 piece design, metal seated, bi directional sealing, pneumatic operated ball valve with Pneumatic actuator. Ball and seats to be matched sets and interchangeable for valves of the same bore size. Seats must be field replaceable. Floating / Trunnion (Advantages for selection to be specified)
2. Pressure rating	:	ANSI Class # 300, (Temperature 600 ° C)
3. End connection	:	Flanged, Raised Face with serrated finish as per ANSI B 16.5.
4. Face to Face	:	As per ANSI B 16.10 (long pattern) Stem extension to take care of high temperature.
5. Bore Size	:	Full bore to 8" size.
6. Body	:	ASTM A 351 Gr CF8M
7. Body fasteners	:	Suitable Stainless Steel material grade
8. Body Gasket		Graphite filled spiral wound gasket or equivalent gasket to withstand high temperature.
9. Ball	:	ASTM A351 Gr CF8M fully spherical ball with **Chromium Carbide** or **Nickel Boron** Coating. The coating thickness, hardness value and process are to be specified.
10. Seat	:	ASTM A351 Gr CF8M type with **Chromium Carbide** or **Nickel Boron C**oating. The coating thickness, hardness and process are to be specified. Hardness value to be specified by supplier
11. Stem	:	A638 GR 660 or equivalent

12. Stem Packing : Graphoil based packing

13. Leakage rating : Class VI as per FCI-70-2-2006.

14. Testing : As per standard for shell hydro, seat hydro and seat pneumatic tests. Supplier to specify the standard.
Testing at Shut off condition, Valve to be subjected to the differential pressure of 3 to 14 bar on both sides with air as testing medium.

15. Mounting of the valve : **Vertical / Horizontal / Inclined direction**

16. Condition of application

(a) Valve operation : The valve should be suitable for 100 cycles of remote control ON/OFF operation per day, open or close within a minute. Supplier to specify the open/close time.

(b) Material of handling : The valve is used to handle gas with fly ash / coal fines at 14 Kg / cm^2 (g) pressure and at 600 ° C temperature.

A) Typical Gas composition : % by weight

12 % CO_2: 16%CO :12% H_2:

2% CH_4: 1% O_2: 57% N_2 and trace level of H_2S.

B) Characteristics of ash

i) Size distribution:

+ 300 Micron	– 9 to 11 %
+ 150 Micron	– 16 to 6 %
+ 75 Micron	– 25 to 8 %
– 75 Micron	– 50 to 75 %
ii) Bulk density	– 1300 Kg /m^3
iii) Particle density	– 2600 Kg/m^3
iv) Nature	– **Abrasive and erosive**

v) Chemical composition:

60 % $Si0_2$: 27 % $A1_2O_3$: 8% Fe_2O_3:5%CaO&MgO:

Trace level of Na_2O & K_2O.

17. Heavy duty Pneumatic Actuator : Suitable pneumatic, Quarter turn, double acting, air to open, air to close, air fail to stay put, and power fail to

close, opening and closing within a minute, with open or close indication for remotely controlled ON - OFF application, to work for pneumatic pressure of 4 Kg / cm^2 (57 PSI), with higher torque actuator in order to take care of the specified application. Preferred actuator torque value would be double that of the value.

Torque values of valve (opening, closing, running) as well as that of actuator should be provided.

Instrument Air pressure Min- 4 Kg/cm^2. For extended shaft, spool piece to be provided to accommodate the actuator suitably.

18. Solenoid valve : ASCO Make (model AEB 342 C1 with ¼" pneumatic tubing) continuous duty, explosion proof, Gr. II A, II B, flame proof for ON – OFF application to operate on min 4 Kg / cm^2 (g) (57 PSI) pneumatic pressure solenoid valve rating is 110V ± 10% and 50 HZ. When the solenoid valve is energized, the ball valve should open and when de-energized or during power failure the ball valve should close. 100 cycles of ON-OFF operation per day is envisaged. ½" NPT cable entry & with suitable double compression gland and ceramic filters for unused ports to be provided.

19. Position feed back limit switch : Explosion proof, Gr.IIA, II B, dust and water proof type IP66 having DPDT with silver plated contact of rating 125 V DC, 0.5 Amps. Preferably "Honey well" make 21CX 16 model. Junction box provided should also confirm to explosion, dust and water proofs. ½'' NPT cable entry & with suitable double compression gland to be provided.

20. Air Filter Regulator : Air filter regulator with manual drain facility with port size ¼ '' NPT (F) Filter range 5 to 25 Microns. Mounted with output gauge (0 to 10 bar).

21. Mounting and Tubing : The Actuator should be mounted on the Ball Valve with proper strong mounting bracket. Solenoid valve and filter regulator should be tubed to the actuator. Tubing should be 6mm OD in SS with double ferrule. Limit switches are directly mounted on the actuator and held by a bracket mounting as per standards.

22. Special instructions:

1. The valve with its accessories should be guaranteed for trouble free operation for a period of 18 months from the date of supply or 12 months from the date of commissioning
2. Vendor to submit drawings and quality plan to BHEL, within a month after Purchase Order, for approval. General arrangement drawing of ball valve with actuator mounting in position to be submitted for approval. Manufacturing of the valve will start only after obtaining the drawing approved from CCDP / BHEL
3. The following are also to be provided at appropriate time:-
    a. Test certificates (TCs) for the material of construction of valve body, ball, seat , stem, etc.,
    b. Test certificates for pressure hydro test of the valve body, for hydro and pneumatic seat leakage rate tests,
    c. Explosion proof, flame proof and dust proof certificates for accessories,
    d. Relevant catalogues viz. quick exhaust valve, actuator type limit switch, solenoid valve etc.,
    e. Relevant standard Numbers for Design, manufacturing and testing,
    f. O&M instruction manual containing assembly / disassembly procedure,
    g. **Spare parts list, supplier to quote for ball & seat with packings, actuator spares separately with other required spares**
    h. Dimensional & Cross sectional drawing of the valve,

i. Dimensional clearance between ball & body seat,
j. Sliding friction coefficient between ball and seat,
k. Surface finish for both ball and seat prior to coating,
l. QAP & QCP along with the schedule,

4. Inspection will be carried out by CCDP / BHEL / Trichy and testing as per point No.14 will be carried out by the supplier in the presence of CCDP / BHEL personnel.
5. Valve marking symbols, abbreviations etc., shall be in accordance with MSS – SP – 25 or relevant standard. Vendors name, valve rating, material designation, nominal size, direction of flow etc, shall be integral on the body. A corrosion resistant tag giving size, tag / code No. etc is to be securely attached on the valve body. Direction of opening/closing should also be given.
6. Valve is to be dry, clean and free from moisture, dirt and loose foreign materials of any kind and protected from rust, corrosion and any mechanical damage during transportation, shipment and storage. Suitable end protectors can be used for each end of valve flange for protection.
7. Packing and forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage.
8. The supplier to suggest the procedure along with required spares for repair/maintenance when the valve starts passing
9. The supplier to include quotation for AMC of ball valve after the guarantee period.
10. BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected.
11. Vendor to have supplied equivalent ball valves for similar application:
    a. Name and postal address of the customer or company
    b. Name and designation of the contact person of the customer
    c. Phone Fax no and email address of the contact person of the customer
    d. Month and year of commissioning of the system and no. of hours of operation.
    e. Application for which the system is supplied.
    f. Performance certificate from the customers regarding satisfactory performance of the system supplied to them.
12. Incomplete offers or offers not meeting the above requirement will not be considered for evaluation

Technical Specification – Supplier to fill all columns

S.No	Technical Specification & BHEL requirement	Supplier:		
		Offer No:	Dt.	
		Supplier Offer	Deviation	Remarks
1	Scope: To supply 8'' size Nickel Boron or Chromium Carbide Coated Ball & Seat, Ball Valve with accessories. Pneumatic Actuator, Air Pressure Regulator, Moisture Trap ,Open/Close indicator Solenoid Valve, Position Feedback Limit Switch and other additional points.			
2	Application: Ball Valve with accessories:(a) Suitablefor100 cycles per day of remote control ON/ OFF operation			
	(b) Suitable for handling materials at 14 Kg/cm^2 (g) pressure & 600° C temp (Ref Annexure for handling material)			
3	Valve Model No			
4	Type: a)Pressure ANSI Class: **#300** Bi-Directional Valve			
	b)Leakage rate:FCI-70-2-2006- **Class VI**			
	c)Fire safe			
	d)Full bore to the size 8"			
	e)2 piece body design			
	f)Fully spherical ball			
	g)Metal seated/seat supported			
	h)Floating /Trunnion			
	i)Pneumatically operated			
5	End connection: Flanged RF to ANSI B 16.5 with serrated finish.			
6	Face to Face: ANSI B 16.10 (long pattern)			

7	Body Material : ASTM A 351Gr CF8M. Valve body std–ASME B16.34. Purge provision on body using N2 or coal gas as purge medium. Supplier to indicate the purge gas pressure.			
8	Body fasteners: Suitable SS High temperature material			
9	Ball: ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
10	Seat:ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
11	Stem: A638 Gr 660 or equivalent			
12	Body Seal: Grafoil /Suitable seal arrangement to withstand high pressure and high temp.			
13	Stem Seal: Grafoil/ suitable seal arrangement to withstand high pressure and high temp.			
14	Mounting of the valve:: Field mounting of ball valve: Suitable to mount in vertical/ horizontal /inclined pipeline.			
15	Heavy duty Pneumatic Actuator:			
	a) Make and Model			
	b)Pneumatic			
	c)Double acting			
	d)Air fail to stay put			
	e)Power fail to close			
	f) For remote control 100 cycles ON/OFF operation per day			
	g)To work for minimum 4 $Kg/cm^2(g)$(57psig) pneumatic pressure			
	h) With air pressure regulator			
	i) With open/close indicator.			

	j)Opening/Closing duration			
	l) Actuator to be selected considering higher resistance offered by ash to valve operation at application conditions. Service factor / capacity of the actuator to be indicated.			
	m) Supplier is to provide the opening, running and closing torque value of the ball valve in Nm			
16	Solenoid valve:			
	a) Make and Model -ASCO Make, AEB342 C3 or Equivalent.			
	b) Rating110V+/- 10%, 50 HZ			
	c) Explosion proof (Gr.IIA, II B)			
	d) Flame proof			
	e) 3/8 ” pneumatic tubing			
	f) For 100 cycles ON/OFF operation per day			
	g) To work for min 4 $Kg/cm^2(g)$ (57 PSI) inst.air pr			
	h) When the solenoid valve is energized, the ball valve should open and when the solenoid valve is de-energized or during power failure the ball valve should close.			
	i) With ½” NPT Cable entry & cable gland			

	j) With double compression gland, & ceramic filters for unused ports.			
17	Position Feedback Limit Switch:			
	a)Make and Model- Honey well 21CX16 preferred			
	b)Rating 125V DC, 0.5 amp			
	c) Explosion proof, Gr.IIA, II B			
	d)Dust and water proof type			
	e)DPDT with silver plated contact			
	f)Flame proof and explosion proof and water proof junction box			
	g) With ½" NPT Cable entry			
	h)With double compression gland			
18	Mounting Assembly: Actuator mounted on the ball valve with bracket and adaptor; open/close indicator & limit switch mounted on the actuator with bracket			
19	Testing: a) Hydrostatic Shell Test-Supplier to specify			
	b) Seat leak tests as per FCI-70-2-2006- **Class VI**			
20	Inspection: a)100% inspection of valves with all accessories by CCDP/ BHEL/Trichy;			
	b) Tests are to be carried out for valves assembled with all accessories by the supplier in the presence of CCDP / BHEL/Trichy personnel and dispatch after clearance by CCDP / BHEL/Trichy.			

	c)All relevant Test Certificates(TCs) for the material of valve body, ball, seat, stem, etc to be submitted			
	d) All relevant Test Certificates (TCs) for explosion proof, flame proof and dust proof certificates for accessories to be submitted.			
21	Drawing: Manufacturing as per drawing approved by CCDP/BHEL/Trichy.			
22	QCP: Supplier is to submit quality control procedure & get it approved by CCDP/BHEL/Trichy.			
23	Valve painting as per standard practice			
24	Valve markings as per standard practice			
25	Packing and Forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage			
26	Guarantee/Warranty: Supplier is to give guarantee/warranty for 12 months from commissioning date or 18 months from dispatch date whichever is earlier			
27	Spares: supplier is to specify the spares for 2 years operation including instrumentation items. Ball & Seat with Packings & Actuator spares			
28	Manual: Supplier is to submit the O&M manual at appropriate time. Six hard copies & a soft copy			

29	Along with Technical Offer supplier is to submit all relevant catalogues and drawings for evaluation. . Supplier to submit the references list applicable to high pressure, high temp and erosive nature in particular gasification plant (Separate sheet may be attached).			

BHEL, Trichy–14
R&D and CR – Purchase Department

SPECIFICATION OF METAL SEATED 10” BALL VALVE

Scope of supply	:	To supply 10’’ metal seated ball valve with **chromium carbide or Nickel Boron** coated ball and seat and accessories as per the following specification. **The above supply is with 2 part bid, ie first technical bid followed by commercial (price) bid.**
1. Ball valve type	:	High temperature, fire safe, full bore, 2 piece design, metal seated, bi directional sealing, pneumatic operated ball valve with Pneumatic actuator. Ball and seats to be matched sets and interchangeable for valves of the same bore size. Seats must be field replaceable. Floating / Trunnion (Advantages for selection to be specified)
2. Pressure rating	:	ANSI Class # 300, (Temperature 600 ° C)
3. End connection	:	Flanged, Raised Face with serrated finish as per ANSI B 16.5.
4. Face to Face	:	As per ANSI B 16.10 (long pattern) Stem extension to take care of high temperature.
5. Bore Size	:	Full bore to 10” size.
6. Body	:	ASTM A 351 Gr CF8M
7. Body fasteners	:	Suitable Stainless Steel material grade
8. Body Gasket		Graphite filled spiral wound gasket or equivalent gasket to withstand high temperature.
9. Ball	:	ASTM A351 Gr CF8M fully spherical ball with **Chromium Carbide** or **Nickel Boron** Coating. The coating thickness, hardness value and process are to be specified.
10. Seat	:	ASTM A351 Gr CF8M type with **Chromium Carbide** or **Nickel Boron C**oating. The coating thickness, hardness and process are to be specified. Hardness value to be specified by supplier
11. Stem	:	A638 GR 660 or equivalent

12. Stem Packing : Graphoil based packing

13. Leakage rating : Class VI as per FCI-70-2-2006.

14. Testing : As per standard for shell hydro, seat hydro and seat pneumatic tests. Supplier to specify the standard.
Testing at Shut off condition, Valve to be subjected to the differential pressure of 3 to 14 bar on both sides with air as testing medium.

15. Mounting of the valve : **Vertical / Horizontal / Inclined direction**

16. Condition of application

(a) Valve operation : The valve should be suitable for 100 cycles of remote control ON/OFF operation per day, open or close within a minute. Supplier to specify the open/close time.

(b) Material of handling : The valve is used to handle gas with fly ash / coal fines at 14 Kg / cm^2 (g) pressure and at 600 ° C temperature.

A) Typical Gas composition : % by weight

12 % CO_2: 16%CO :12% H_2:

2% CH_4: 1% O_2: 57% N_2 and trace level of H_2S.

B) Characteristics of ash

i) Size distribution:

+ 300 Micron	– 9 to 11 %
+ 150 Micron	– 16 to 6 %
+ 75 Micron	– 25 to 8 %
– 75 Micron	– 50 to 75 %
ii) Bulk density	– 1300 Kg /m^3
iii) Particle density	– 2600 Kg/m^3
iv) Nature	– **Abrasive and erosive**

v) Chemical composition:

60 % $Si0_2$: 27 % $A1_2O_3$: 8% Fe_2O_3:5%CaO&MgO:

Trace level of Na_2O & K_2O.

17. Heavy duty Pneumatic Actuator : Suitable pneumatic, Quarter turn, double acting, air to open, air to close, air fail to stay put, and power fail to

close, opening and closing within a minute, with open or close indication for remotely controlled ON - OFF application, to work for pneumatic pressure of 4 Kg / cm^2 (57 PSI), with higher torque actuator in order to take care of the specified application. Preferred actuator torque value would be double that of the value.

Torque values of valve (opening, closing, running) as well as that of actuator should be provided.

Instrument Air pressure Min- 4 Kg/cm^2. For extended shaft, spool piece to be provided to accommodate the actuator suitably.

18. Solenoid valve : ASCO Make (model AEB 342 C1 with ¼" pneumatic tubing) continuous duty, explosion proof, Gr. II A, II B, flame proof for ON – OFF application to operate on min 4 Kg / cm^2 (g) (57 PSI) pneumatic pressure solenoid valve rating is 110V ± 10% and 50 HZ. When the solenoid valve is energized, the ball valve should open and when de-energized or during power failure the ball valve should close. 100 cycles of ON-OFF operation per day is envisaged. ½" NPT cable entry & with suitable double compression gland and ceramic filters for unused ports to be provided.

19. Position feed back limit switch : Explosion proof, Gr.IIA, II B, dust and water proof type IP66 having DPDT with silver plated contact of rating 125 V DC, 0.5 Amps. Preferably "Honey well" make 21CX 16 model. Junction box provided should also confirm to explosion, dust and water proofs. ½'' NPT cable entry & with suitable double compression gland to be provided.

20. Air Filter Regulator : Air filter regulator with manual drain facility with port size ¼ '' NPT (F) Filter range 5 to 25 Microns. Mounted with output gauge (0 to 10 bar).

21. Mounting and Tubing : The Actuator should be mounted on the Ball Valve with proper strong mounting bracket. Solenoid valve and filter regulator should be tubed to the actuator. Tubing should be 6mm OD in SS with double ferrule. Limit switches are directly mounted on the actuator and held by a bracket mounting as per standards.

22. Special instructions:

1. The valve with its accessories should be guaranteed for trouble free operation for a period of 18 months from the date of supply or 12 months from the date of commissioning
2. Vendor to submit drawings and quality plan to BHEL, within a month after Purchase Order, for approval. General arrangement drawing of ball valve with actuator mounting in position to be submitted for approval. Manufacturing of the valve will start only after obtaining the drawing approved from CCDP / BHEL
3. The following are also to be provided at appropriate time:-
    a. Test certificates (TCs) for the material of construction of valve body, ball, seat , stem, etc.,
    b. Test certificates for pressure hydro test of the valve body, for hydro and pneumatic seat leakage rate tests,
    c. Explosion proof, flame proof and dust proof certificates for accessories,
    d. Relevant catalogues viz. quick exhaust valve, actuator type limit switch, solenoid valve etc.,
    e. Relevant standard Numbers for Design, manufacturing and testing,
    f. O&M instruction manual containing assembly / disassembly procedure,
    g. **Spare parts list, supplier to quote for ball & seat with packings, actuator spares separately with other required spares**
    h. Dimensional & Cross sectional drawing of the valve,

i. Dimensional clearance between ball & body seat,
j. Sliding friction coefficient between ball and seat,
k. Surface finish for both ball and seat prior to coating,
l. QAP & QCP along with the schedule,

4. Inspection will be carried out by CCDP / BHEL / Trichy and testing as per point No.14 will be carried out by the supplier in the presence of CCDP / BHEL personnel.
5. Valve marking symbols, abbreviations etc., shall be in accordance with MSS – SP – 25 or relevant standard. Vendors name, valve rating, material designation, nominal size, direction of flow etc, shall be integral on the body. A corrosion resistant tag giving size, tag / code No. etc is to be securely attached on the valve body. Direction of opening/closing should also be given.
6. Valve is to be dry, clean and free from moisture, dirt and loose foreign materials of any kind and protected from rust, corrosion and any mechanical damage during transportation, shipment and storage. Suitable end protectors can be used for each end of valve flange for protection.
7. Packing and forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage.
8. The supplier to suggest the procedure along with required spares for repair/maintenance when the valve starts passing
9. The supplier to include quotation for AMC of ball valve after the guarantee period.
10. BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected.
11. Vendor to have supplied equivalent ball valves for similar application:
    a. Name and postal address of the customer or company
    b. Name and designation of the contact person of the customer
    c. Phone Fax no and email address of the contact person of the customer
    d. Month and year of commissioning of the system and no. of hours of operation.
    e. Application for which the system is supplied.
    f. Performance certificate from the customers regarding satisfactory performance of the system supplied to them.
12. Incomplete offers or offers not meeting the above requirement will not be considered for evaluation

Technical Specification – Supplier to fill all columns

S.No	Technical Specification & BHEL requirement	Supplier:		
		Offer No:	Dt.	
		Supplier Offer	Deviation	Remarks
1	Scope: To supply 10'' size Nickel Boron or Chromium Carbide Coated Ball & Seat, Ball Valve with accessories. Pneumatic Actuator, Air Pressure Regulator, Moisture Trap ,Open/Close indicator Solenoid Valve, Position Feedback Limit Switch and other additional points.			
2	Application: Ball Valve with accessories:(a) Suitablefor100 cycles per day of remote control ON/ OFF operation			
	(b) Suitable for handling materials at 14 Kg/cm^2 (g) pressure & 600° C temp (Ref Annexure for handling material)			
3	Valve Model No			
4	Type: a)Pressure ANSI Class: **#300** Bi-Directional Valve			
	b)Leakage rate:FCI-70-2-2006- **Class VI**			
	c)Fire safe			
	d)Full bore to the size 10"			
	e)2 piece body design			
	f)Fully spherical ball			
	g)Metal seated/seat supported			
	h)Floating /Trunnion			
	i)Pneumatically operated			
5	End connection: Flanged RF to ANSI B 16.5 with serrated finish.			
6	Face to Face: ANSI B 16.10 (long pattern)			

7	Body Material : ASTM A 351Gr CF8M. Valve body std–ASME B16.34. Purge provision on body using N2 or coal gas as purge medium. Supplier to indicate the purge gas pressure.			
8	Body fasteners: Suitable SS High temperature material			
9	Ball: ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
10	Seat:ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
11	Stem: A638 Gr 660 or equivalent			
12	Body Seal: Grafoil /Suitable seal arrangement to withstand high pressure and high temp.			
13	Stem Seal: Grafoil/ suitable seal arrangement to withstand high pressure and high temp.			
14	Mounting of the valve:: Field mounting of ball valve: Suitable to mount in vertical/ horizontal /inclined pipeline.			
15	Heavy duty Pneumatic Actuator:			
	a) Make and Model			
	b)Pneumatic			
	c)Double acting			
	d)Air fail to stay put			
	e)Power fail to close			
	f) For remote control 100 cycles ON/OFF operation per day			
	g)To work for minimum 4 $Kg/cm^2(g)$(57psig) pneumatic pressure			
	h) With air pressure regulator			
	i) With open/close indicator.			

	j)Opening/Closing duration			
	l) Actuator to be selected considering higher resistance offered by ash to valve operation at application conditions. Service factor / capacity of the actuator to be indicated.			
	m) Supplier is to provide the opening, running and closing torque value of the ball valve in Nm			
16	Solenoid valve:			
	a) Make and Model -ASCO Make, AEB342 C3 or Equivalent.			
	b) Rating110V+/- 10%, 50 HZ			
	c) Explosion proof (Gr.IIA, II B)			
	d) Flame proof			
	e) 3/8 ” pneumatic tubing			
	f) For 100 cycles ON/OFF operation per day			
	g) To work for min 4 $Kg/cm^2(g)$ (57 PSI) inst.air pr			
	h) When the solenoid valve is energized, the ball valve should open and when the solenoid valve is de-energized or during power failure the ball valve should close.			
	i) With ½” NPT Cable entry & cable gland			

	j) With double compression gland, & ceramic filters for unused ports.			
17	Position Feedback Limit Switch:			
	a)Make and Model- Honey well 21CX16 preferred			
	b)Rating 125V DC, 0.5 amp			
	c) Explosion proof, Gr.IIA, II B			
	d)Dust and water proof type			
	e)DPDT with silver plated contact			
	f)Flame proof and explosion proof and water proof junction box			
	g) With ½" NPT Cable entry			
	h)With double compression gland			
18	Mounting Assembly: Actuator mounted on the ball valve with bracket and adaptor; open/close indicator & limit switch mounted on the actuator with bracket			
19	Testing: a) Hydrostatic Shell Test-Supplier to specify			
	b) Seat leak tests as per FCI-70-2-2006- **Class VI**			
20	Inspection: a)100% inspection of valves with all accessories by CCDP/ BHEL/Trichy;			
	b) Tests are to be carried out for valves assembled with all accessories by the supplier in the presence of CCDP / BHEL/Trichy personnel and dispatch after clearance by CCDP / BHEL/Trichy.			

	c)All relevant Test Certificates(TCs) for the material of valve body, ball, seat, stem, etc to be submitted			
	d) All relevant Test Certificates (TCs) for explosion proof, flame proof and dust proof certificates for accessories to be submitted.			
21	Drawing: Manufacturing as per drawing approved by CCDP/BHEL/Trichy.			
22	QCP: Supplier is to submit quality control procedure & get it approved by CCDP/BHEL/Trichy.			
23	Valve painting as per standard practice			
24	Valve markings as per standard practice			
25	Packing and Forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage			
26	Guarantee/Warranty: Supplier is to give guarantee/warranty for 12 months from commissioning date or 18 months from dispatch date whichever is earlier			
27	Spares: supplier is to specify the spares for 2 years operation including instrumentation items. Ball & Seat with Packings & Actuator spares			
28	Manual: Supplier is to submit the O&M manual at appropriate time. Six hard copies & a soft copy			

29	Along with Technical Offer supplier is to submit all relevant catalogues and drawings for evaluation. . Supplier to submit the references list applicable to high pressure, high temp and erosive nature in particular gasification plant (Separate sheet may be attached).			

BHEL, Trichy–14
R&D and CR – Purchase Department

SPECIFICATION OF METAL SEATED 16" BALL VALVE

Scope of supply	:	To supply 16'' metal seated ball valve with **chromium carbide or Nickel Boron** coated ball and seat and accessories as per the following specification. **The above supply is with 2 part bid, ie first technical bid followed by commercial (price) bid.**
1. Ball valve type	:	High temperature, fire safe, full bore, 2 piece design, metal seated, bi directional sealing, pneumatic operated ball valve with Pneumatic actuator. Ball and seats to be matched sets and interchangeable for valves of the same bore size. Seats must be field replaceable. Floating / Trunnion (Advantages for selection to be specified)
2. Pressure rating	:	ANSI Class # 300, (Temperature 600 ° C)
3. End connection	:	Flanged, Raised Face with serrated finish as per ANSI B 16.5.
4. Face to Face	:	As per ANSI B 16.10 (long pattern) Stem extension to take care of high temperature.
5. Bore Size	:	Full bore to 16" size.
6. Body	:	ASTM A 351 Gr CF8M
7. Body fasteners	:	Suitable Stainless Steel material grade
8. Body Gasket		Graphite filled spiral wound gasket or equivalent gasket to withstand high temperature.
9. Ball	:	ASTM A351 Gr CF8M fully spherical ball with **Chromium Carbide** or **Nickel Boron** Coating. The coating thickness, hardness value and process are to be specified.
10. Seat	:	ASTM A351 Gr CF8M type with **Chromium Carbide** or **Nickel Boron C**oating. The coating thickness, hardness and process are to be specified. Hardness value to be specified by supplier
11. Stem	:	A638 GR 660 or equivalent
12. Stem Packing	:	Graphoil based packing

13. Leakage rating : Class VI as per FCI-70-2-2006.

14. Testing : As per standard for shell hydro, seat hydro and seat pneumatic tests. Supplier to specify the standard.
Testing at Shut off condition, Valve to be subjected to the differential pressure of 3 to 14 bar on both sides with air as testing medium.

15. Mounting of the valve : **Vertical / Horizontal / Inclined direction**

16. Condition of application

(a) Valve operation : The valve should be suitable for 100 cycles of remote control ON/OFF operation per day, open or close within a minute. Supplier to specify the open/close time.

(b) Material of handling : The valve is used to handle gas with fly ash / coal fines at 14 Kg / cm^2 (g) pressure and at 600 ° C temperature.

A) Typical Gas composition : % by weight

12 % CO_2: 16%CO :12% H_2:

2% CH_4: 1% O_2: 57% N_2 and trace level of H_2S.

B) Characteristics of ash

i) Size distribution:

+ 300 Micron	– 9 to 11 %
+ 150 Micron	– 16 to 6 %
+ 75 Micron	– 25 to 8 %
– 75 Micron	– 50 to 75 %
ii) Bulk density	– 1300 Kg /m^3
iii) Particle density	– 2600 Kg/m^3
iv) Nature	– **Abrasive and erosive**

v) Chemical composition:

60 % $Si0_2$: 27 % $A1_2O_3$: 8% Fe_2O_3:5%CaO&MgO:

Trace level of Na_2O & K_2O.

17. Heavy duty Pneumatic Actuator : Suitable pneumatic, Quarter turn, double acting, air to open, air to close, air fail to stay put, and power fail to close, opening and closing within a minute, with open or close indication for remotely controlled ON - OFF application, to work for pneumatic pressure of 4 Kg / cm^2

		(57 PSI), with higher torque actuator in order to take care of the specified application. Preferred actuator torque value would be double that of the value. Torque values of valve (opening, closing, running) as well as that of actuator should be provided. Instrument Air pressure Min- 4 Kg/cm^2. For extended shaft, spool piece to be provided to accommodate the actuator suitably.
18. Solenoid valve	:	ASCO Make (model AEB 342 C1 with ¼" pneumatic tubing) continuous duty, explosion proof, Gr. II A, II B, flame proof for ON – OFF application to operate on min 4 Kg / cm^2 (g) (57 PSI) pneumatic pressure solenoid valve rating is 110V ± 10% and 50 HZ. When the solenoid valve is energized, the ball valve should open and when de-energized or during power failure the ball valve should close. 100 cycles of ON-OFF operation per day is envisaged. ½" NPT cable entry & with suitable double compression gland and ceramic filters for unused ports to be provided.
19. Position feed back limit switch	:	Explosion proof, Gr.IIA, II B, dust and water proof type IP66 having DPDT with silver plated contact of rating 125 V DC, 0.5 Amps. Preferably "Honey well" make 21CX 16 model. Junction box provided should also confirm to explosion, dust and water proofs. ½'' NPT cable entry & with suitable double compression gland to be provided.
20. Air Filter Regulator	:	Air filter regulator with manual drain facility with port size ¼ '' NPT (F) Filter range 5 to 25 Microns. Mounted with output gauge (0 to 10 bar).
21. Mounting and Tubing	:	The Actuator should be mounted on the Ball Valve

with proper strong mounting bracket. Solenoid valve and filter regulator should be tubed to the actuator. Tubing should be 6mm OD in SS with double ferrule. Limit switches are directly mounted on the actuator and held by a bracket mounting as per standards.

22. Special instructions:

1. The valve with its accessories should be guaranteed for trouble free operation for a period of 18 months from the date of supply or 12 months from the date of commissioning
2. Vendor to submit drawings and quality plan to BHEL, within a month after Purchase Order, for approval. General arrangement drawing of ball valve with actuator mounting in position to be submitted for approval. Manufacturing of the valve will start only after obtaining the drawing approved from CCDP / BHEL
3. The following are also to be provided at appropriate time:-
    a. Test certificates (TCs) for the material of construction of valve body, ball, seat , stem, etc.,
    b. Test certificates for pressure hydro test of the valve body, for hydro and pneumatic seat leakage rate tests,
    c. Explosion proof, flame proof and dust proof certificates for accessories,
    d. Relevant catalogues viz. quick exhaust valve, actuator type limit switch, solenoid valve etc.,
    e. Relevant standard Numbers for Design, manufacturing and testing,
    f. O&M instruction manual containing assembly / disassembly procedure,
    g. **Spare parts list, supplier to quote for ball & seat with packings, actuator spares separately with other required spares**
    h. Dimensional & Cross sectional drawing of the valve,
    i. Dimensional clearance between ball & body seat,
    j. Sliding friction coefficient between ball and seat,
    k. Surface finish for both ball and seat prior to coating,
    l. QAP & QCP along with the schedule,
4. Inspection will be carried out by CCDP / BHEL / Trichy and testing as per point No.14 will be carried out by the supplier in the presence of CCDP / BHEL personnel.

5. Valve marking symbols, abbreviations etc., shall be in accordance with MSS – SP – 25 or relevant standard. Vendors name, valve rating, material designation, nominal size, direction of flow etc, shall be integral on the body. A corrosion resistant tag giving size, tag / code No. etc is to be securely attached on the valve body. Direction of opening/closing should also be given.
6. Valve is to be dry, clean and free from moisture, dirt and loose foreign materials of any kind and protected from rust, corrosion and any mechanical damage during transportation, shipment and storage. Suitable end protectors can be used for each end of valve flange for protection.
7. Packing and forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage.
8. The supplier to suggest the procedure along with required spares for repair/maintenance when the valve starts passing
9. The supplier to include quotation for AMC of ball valve after the guarantee period.
10. BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected.
11. Vendor to have supplied equivalent ball valves for similar application:
    a. Name and postal address of the customer or company
    b. Name and designation of the contact person of the customer
    c. Phone Fax no and email address of the contact person of the customer
    d. Month and year of commissioning of the system and no. of hours of operation.
    e. Application for which the system is supplied.
    f. Performance certificate from the customers regarding satisfactory performance of the system supplied to them.
12. Incomplete offers or offers not meeting the above requirement will not be considered for evaluation

Technical Specification – Supplier to fill all columns

S.No	Technical Specification & BHEL requirement	Supplier:		
		Offer No:	Dt.	
		Supplier Offer	Deviation	Remarks
1	Scope: To supply 16'' size Nickel Boron or Chromium Carbide Coated Ball & Seat, Ball Valve with accessories. Pneumatic Actuator, Air Pressure Regulator, Moisture Trap ,Open/Close indicator Solenoid Valve, Position Feedback Limit Switch and other additional points.			
2	Application: Ball Valve with accessories:(a) Suitablefor100 cycles per day of remote control ON/ OFF operation			
	(b) Suitable for handling materials at 14 Kg/cm^2 (g) pressure & 600° C temp (Ref Annexure for handling material)			
3	Valve Model No			
4	Type: a)Pressure ANSI Class: **#300** Bi-Directional Valve			
	b)Leakage rate:FCI-70-2-2006- **Class VI**			
	c)Fire safe			
	d)Full bore to the size 16"			
	e)2 piece body design			
	f)Fully spherical ball			
	g)Metal seated/seat supported			
	h)Floating /Trunnion			
	i)Pneumatically operated			
5	End connection: Flanged RF to ANSI B 16.5 with serrated finish.			
6	Face to Face: ANSI B 16.10 (long pattern)			

7	Body Material : ASTM A 351Gr CF8M. Valve body std–ASME B16.34. Purge provision on body using N2 or coal gas as purge medium. Supplier to indicate the purge gas pressure.			
8	Body fasteners: Suitable SS High temperature material			
9	Ball: ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
10	Seat:ASTM A351 Gr.CF8M with CrC or Ni-Bo Coating			
11	Stem: A638 Gr 660 or equivalent			
12	Body Seal: Grafoil /Suitable seal arrangement to withstand high pressure and high temp.			
13	Stem Seal: Grafoil/ suitable seal arrangement to withstand high pressure and high temp.			
14	Mounting of the valve:: Field mounting of ball valve: Suitable to mount in vertical/ horizontal /inclined pipeline.			
15	Heavy duty Pneumatic Actuator:			
	a) Make and Model			
	b)Pneumatic			
	c)Double acting			
	d)Air fail to stay put			
	e)Power fail to close			
	f) For remote control 100 cycles ON/OFF operation per day			
	g)To work for minimum 4 $Kg/cm^2(g)$(57psig) pneumatic pressure			
	h) With air pressure regulator			
	i) With open/close indicator.			
	j)Opening/Closing duration			

	l) Actuator to be selected considering higher resistance offered by ash to valve operation at application conditions. Service factor / capacity of the actuator to be indicated.			
	m) Supplier is to provide the opening, running and closing torque value of the ball valve in Nm			
16	Solenoid valve:			
	a) Make and Model -ASCO Make, AEB342 C3 or Equivalent.			
	b) Rating110V+/- 10%, 50 HZ			
	c) Explosion proof (Gr.IIA, II B)			
	d) Flame proof			
	e) 3/8 ” pneumatic tubing			
	f) For 100 cycles ON/OFF operation per day			
	g) To work for min 4 $Kg/cm^2(g)$ (57 PSI) inst.air pr			
	h) When the solenoid valve is energized, the ball valve should open and when the solenoid valve is de-energized or during power failure the ball valve should close.			
	i) With ½” NPT Cable entry & cable gland			
	j) With double compression gland, & ceramic filters for unused ports.			

17	Position Feedback Limit Switch:			
	a)Make and Model- Honey well 21CX16 preferred			
	b)Rating 125V DC, 0.5 amp			
	c) Explosion proof, Gr.IIA, II B			
	d)Dust and water proof type			
	e)DPDT with silver plated contact			
	f)Flame proof and explosion proof and water proof junction box			
	g) With ½" NPT Cable entry			
	h)With double compression gland			
18	Mounting Assembly: Actuator mounted on the ball valve with bracket and adaptor; open/close indicator & limit switch mounted on the actuator with bracket			
19	Testing: a) Hydrostatic Shell Test-Supplier to specify			
	b) Seat leak tests as per FCI-70-2-2006- **Class VI**			
20	Inspection: a)100% inspection of valves with all accessories by CCDP/ BHEL/Trichy;			
	b) Tests are to be carried out for valves assembled with all accessories by the supplier in the presence of CCDP / BHEL/Trichy personnel and dispatch after clearance by CCDP / BHEL/Trichy.			
	c)All relevant Test Certificates(TCs) for the material of valve body, ball, seat, stem, etc to be submitted			

	d) All relevant Test Certificates (TCs) for explosion proof, flame proof and dust proof certificates for accessories to be submitted.			
21	Drawing: Manufacturing as per drawing approved by CCDP/BHEL/Trichy.			
22	QCP: Supplier is to submit quality control procedure & get it approved by CCDP/BHEL/Trichy.			
23	Valve painting as per standard practice			
24	Valve markings as per standard practice			
25	Packing and Forwarding: Seaworthy standard packing without mechanical damage during transportation, shipment and storage			
26	Guarantee/Warranty: Supplier is to give guarantee/warranty for 12 months from commissioning date or 18 months from dispatch date whichever is earlier			
27	Spares: supplier is to specify the spares for 2 years operation including instrumentation items. Ball & Seat with Packings & Actuator spares			
28	Manual: Supplier is to submit the O&M manual at appropriate time. Six hard copies & a soft copy			
29	Along with Technical Offer supplier is to submit all relevant catalogues and drawings for evaluation. . Supplier to submit the references list applicable to high pressure, high temp and erosive nature in particular gasification plant (Separate sheet may be attached).			

R&D and Coal Research/MM , BHEL,Trichy-14

GENERAL TERMS & CONDITIONS OF CONTRACT

1. DEFINITION OF TERMS

Throughout the Tender Documents including the Enquiry Letter, the following words shall have the meanings assigned to them herein, unless the subject matter or the context requires otherwise.

1.1. The '**Purchaser**' or '**BHEL**' shall mean Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act 1956 acting through its Tiruchirappalli Unit **,** BHEL House, Siri Fort, New Delhi-110 049, which expression shall include its successors and assigns. Tenders are to be submitted to M/s BHEL Tiruchirappalli.

1.2. The '**Tenderer'** shall mean the Firm/Company/Organisation, which quotes against the Tender Enquiry issued by the Purchaser. It may also be referred as **'Bidder'**.

1.3. The '**Supplier'** shall mean the firm/company/organisation with whom the Order/Contract is made and shall be deemed to include his successors, representatives, heirs, executors, administrators and permitted assigns, as the case may be. It may also be referred as '**Contractor' or 'Vendor'.**

1.4. The '**Sub-contractor'** shall mean the person/firm/company/ organisation to whom any part of the work has been sub-contracted by the Supplier, with the written consent of the Purchaser and shall include his heirs, executors, administrators, representatives and assigns.

1.5. The '**Engineer**', for the purpose of this Contract shall mean an engineer, person or company duly appointed as such from time to time or such other officials as may be duly authorised and appointed and notified in writing by purchaser to act as engineer. In cases where no such Engineer has been so appointed, the word 'Engineer' shall mean the Purchaser or his duly authorised representative.

1.6. The '**Equipment'** shall mean and include plant and stores and materials to be provided by the Supplier under the Contract.

1.7. The '**Specification'** shall mean the specifications contained in the Tender Documents and any subsequent modifications thereof and the drawings, schedules etc. attached thereto, if any.

1.8. The **'Offer'** shall mean and include the technical and commercial documents including specifications, schedule of prices and quantities, drawings etc submitted by the Tenderer in response to the tender enquiry and any subsequent clarifications thereof. It may also be referred as **'Bid'.**

1.9. **'Acceptance of offer'** shall mean issue of letter of intent/award or memorandum or detailed Order/Contract communicating the acceptance of offer, to the successful Tenderer.

1.10. The '**Contract**' shall mean and include the general conditions, bidding conditions, specific conditions, specifications, schedules, drawings, form of tender, Offer, covering letters, schedule of prices and quantities, letter of intent/award of the Purchaser, Offer of the Tenderer, any special conditions applicable to the particular Order and subsequent amendments mutually agreed upon. It may also be referred as '**Order'** or '**Purchase order'.**

1.11. The **'Contract Price'** shall mean the total price to be paid by the Purchaser to the Vendor for the supply & services to be provided by the Vendor to the Purchaser as per Contract. It may also be referred as **'Order Value'**.

1.12. The **'Site'** shall mean the site of the proposed work at CCDP Plant BHEL at Tiruchirappalli.

1.13. The `**Inspector'** shall mean the Purchaser for the time being or such other person as may be duly authorised and appointed in writing by Purchaser to act as Inspector for the purpose of Contract.

1.14. '**Approved**' shall mean the approval of the Engineer or of the inspector as the case may be in writing.

1.15. **'Test on completion'** shall mean such tests as are prescribed by the specifications and/or tests mutually agreed upon by the Purchaser and the Supplier, to be performed by the Supplier after Installation of the equipment to establish satisfactory operation as required by the specifications.

1.16. '**Commissioning**' shall mean the first operation of the equipment after all initial adjustments, trials, cleaning and re-assembly required at site, if any, have been completed and equipment is made ready for commercial use.

1.17. **'Performance Tests'** shall mean the tests to be conducted on the equipment at site for checking the performance parameters of the equipment as defined in Technical Specification.

1.18. **'Commercial use'** shall mean that use of the equipment, which the Contract contemplates or of which it is to be commercially capable.

1.19. **'Acceptance of Equipment'** shall have the meaning as specified elsewhere in this document.

1.20. **'Consignee'** shall mean the official(s)/person(s) to whom the Equipment is required to be delivered in the manner indicated in the Purchase Order.

1.21. **'Contract Engineer'** shall mean the official who has signed the Order/Contract on behalf of the Purchaser.

1.22. **'Site Engineer'** shall mean officer of the Purchaser as may be duly appointed and authorised in writing by the purchaser to act as the Site Engineer on his behalf.

1.23. '**Months**' shall mean calendar months.

1.24. **'Days'** shall mean calendar days.

1.25. **'Writing'** shall include any manuscript, typewritten or printed statement under or over signature, seal as the case may be.

The words incorporating singular shall include plural and vice-versa, in the words importing masculine gender shall include feminine and vice-versa and the words importing persons shall include bodies corporate, limited liability companies, partnership and other legal entities.

2. SUBMISSION OF TENDER

2.1. General

2.1.1. The tender shall be addressed to Addl. General Manager,(MM), R&D and Coal Research, CRC Building WRI Complex, BHEL, Tiruchirappalli 620014 (Tamilnadu) and shall be submitted with one original and one duplicate copy.

2.1.2. Sealed Tenders may be submitted personally, by Courier or by registered post with due allowance for any transit/postal delay. The tenders received after due date and time of opening are liable to be rejected. Telegraphic offers and offers received by fax/email may not be considered unless confirmed in writing by a detailed offer.

2.1.3. The Tenderer shall closely peruse all the clauses, specifications and drawings indicated in the Tender Documents before quoting. Should the Tenderer have any doubt about the meaning of any portion of the Tender Specifications or find discrepancies / omissions in the drawings or the tender documents issued are incomplete or shall require clarification on any of the technical aspect, scope of work etc., he shall at once contact the authority inviting the tender for clarification before submission of the tender. The specifications and terms and conditions shall be deemed to have been accepted unless otherwise specifically commented upon by the Tenderer in his Offer.

2.1.4. Tenderer must fill the schedules and furnish all the required information as per the instructions given in various sections of the tender specification. Each and every page of the offer must be signed, stamped and submitted by the Tenderer. The information furnished shall be complete by itself.

2.1.5. The tender shall quote the rates in English Language using international numerals. These rates shall be entered in figures as well as in words. For the purpose of the tender, the metric system of units shall be used.

2.1.6. All entries in the tender shall either be typed or be written in blue ink. Erasures and overwriting are not permitted and may render such tenders liable to summary rejection. The Tenderer shall duly attest all cancellations and insertions. Signatures shall be in blue ink.

2.1.7. DUNS number (allotted by M/s Dun & Bradstreet) shall be mentioned in the offer in case of foreign suppliers.

2.1.8. The Offer shall be signed by a person who has requisite authority from the Tenderer to do so.

2.1.9. Standard pre-printed conditions of the Tenderer attached to the offer will not be accepted and only those mentioned in the body of his offer will be considered.

2.1.10. No request for extension of due date will be entertained.

2.2. Two Part Bids

2.2.1. Bidders shall submit the offer in three inner envelops (covers) and one outer envelop (cover) as indicated below.

2.2.2. Envelope I: This sealed envelope should contain all the copies of technical & commercial bid together with **Un-Priced** This envelope should be clearly marked **"Part I - Technical and commercial bid"**, indicating Tender No., Due Date and Address & Reference of the Bidder.

2.2.3. **Envelope II:** This sealed envelope should contain only **price formats with prices as per the specification**. This envelope should be clearly marked **"Part II - Price bid"**, indicating Tender No., Due Date and Address & Reference of the Bidder.

2.2.4. All the envelopes shall be put in one envelop, duly sealed, super scribed as Part I and Part II of Enquiry No., due date of opening, name & address of the officer inviting Tender and the address and reference of the Bidder.

2.3. Part I – Technical and Commercial Bid

2.3.1. Technical

This part shall include / indicate the following:

2.3.1.1. Complete scope of supply with all technical details and other terms and conditions.

2.3.1.2. Point by point confirmation for the Technical Specification in the specified format. If there are any deviations, the same should be clearly specified. Offers received without confirmation to our specification will be rejected.

2.3.1.3. List of customers to whom same or similar equipment have been supplied along with performance certificates.

2.3.1.4. Relevant catalogues.

2.3.1.5. List of spare parts (with part numbers) for two years operation and maintenance.

2.3.1.6. You should also furnish details of shipping specification, sizes, volume, Gross weight, number of cases or no. of container (40' or 20') required for shipping the material etc. When articles are packed with packaging material of plant origin, phytosanitary certificate will be required (Applicable for foreign suppliers only).

2.3.2. Commercial

This part shall include / indicate the following:

2.3.2.1. Port of shipment / Station of dispatch
2.3.2.2. Terms of payment
2.3.2.3. Taxes & duties applicable.
2.3.2.4. Delivery Schedule
2.3.2.5. Offer validity
2.3.2.6. Country of origin
2.3.2.7. A copy of "Un-Priced Part II" i.e., a copy of the Price Bid without price particulars. Instead of the price, the Tenderer shall write 'quoted' against the item for which price have been quoted in the Price Bid.

2.4. Part II (PRICE- BID)

This part should contain the schedule of price particulars co-related to the technical details provided in Part I.

3. OPENING OF TENDERS

3.1. The offer should reach our office on or before 13.00 hrs on the due date. The tender can also be dropped in the Tender Box kept at Coal Research Centre Building (Near WRI Complex). The tenders will be opened after 14.30 hrs on the due date in presence of all bidders who will be present.

3.2. Authorised officer of BHEL at his office shall open tenders at the time and date as specified in the tender notice in the presence of such of those Tenderers or their authorised representative who may be present. However, The Purchaser reserves the right to open the tenders in-camera.

3.3. The Part I - Technical & commercial bid alone would be opened on the Tender opening date.

3.4. The Part II - Price bid of only those Bidders who have been found to be techno-commercially suitable would be opened at a later date. These Bidders would be informed about the tender opening date.

3.5. Clarifications, if any, required by BHEL for technical and commercial evaluation may be sought from Bidders before opening of Part II - price bid.

3.6. In case it becomes necessary for the Tenderer to make any changes in his original price bid (Part-II) on account of technical/commercial confirmations/clarifications, against the changes advised by the purchaser to bring the offer in line with the requirement of the specifications, the impact of such changes on price shall be submitted in the form of a revised price bid, if asked for by the Purchaser.

3.7. If a revised price bid has been submitted, normally only the final revised price bid shall be opened. However, BHEL reserves the right to open the earlier price bids, if required.

3.8. Unsolicited price bids shall not be entertained.

3.9. Any revision or changes in quoted prices and/or conditions of offer made after tender opening, which will give benefit to the Tenderer over others, may result in rejection of the tender.

4. QUALIFICATION OF TENDERERS

4.1. Details of Qualification Requirements are given in Technical Specifications if any.

4.2. Only Tenderer who has previous experience in the work of this nature and description detailed in this tender specification are expected to quote for this work. Offer from Tenderer who does not have proven and established experience in the field is not likely to be considered.

5. VALIDITY OF OFFER

5.1. The offer shall be open for acceptance from the date of opening of tender *Part - I* for six months period. In case the Purchaser calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer, which shall be binding on the Tenderer.

6. REJECTION OF TENDER AND OTHER CONDITIONS

6.1. The acceptance of Tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights to reject any or all the Tenders without assigning any reason whatsoever.

6.2. Conditional and unsigned tenders, tenders containing absurd or unworkable rates and amounts, tenders which are incomplete or otherwise considered defective and tenders not in accordance with the tender conditions, specifications, etc., are liable to be rejected.

6.3. If the Tenderer deliberately gives wrong information in his tender, Purchaser reserves the right to reject such tender at any stage or to cancel the Contract, if awarded and forfeit the Security Deposit.

6.4. Canvassing in any form in connection with the tender is strictly prohibited and the tenders submitted by the Tenderer who resorts to canvassing are liable to be rejected.

7. EVALUATION OF OFFERS

7.1. Evaluation of offers shall be on the basis of delivered cost at BHEL Tiruchirappalli i.e. total cost to the Purchaser, taking into consideration loadings, if any, and all available financial advantages.

7.2. Deviations (Commercial as well as Technical) from the Tender Specifications are generally not acceptable. However, if any deviation is considered by the Purchaser, the same shall be loaded for comparison, while evaluating the offer.

7.3. The Purchaser reserves its right to allow to the Public Sector Enterprises ordering and price preference facilities as admissible under the existing policy of the Govt. of India.

8. LETTER OF INTENT

8.1. The Purchaser shall issue a Letter of Intent for award of work to the successful Tenderer as soon as his Bid has been accepted giving brief details of the equipment and other terms & conditions.

8.2. Detailed Purchase Order will be issued by the Purchaser after issue of the Letter of Intent but after receipt of Security deposit (SD) cum Performance Bank Guarantee (PBG) mentioned at Sl No.18.

9. EFFECTIVE DATE OF CONTRACT

9.1. The responsibility of successful Tenderer under this Contract commences from the date of issue of the Letter of Intent by the Purchaser.

9.2. The Effective Date of Contract shall be the date of issue of the Letter of Intent.

10. PRICES

10.1. The prices shall be firm and shall be quoted as per the enclosed specification.

10.2. The price for foreign supplies shall be inclusive of all taxes and duties up to FOB port of shipment. The price for Indian supplies shall be inclusive of all taxes and duties (including excise duty and sales tax/ VAT) up to FOR Site including transit insurance.

10.3. The excise duty and sales tax/ VAT for Indian supplies will be paid at the rate applicable on the day of dispatch. However, if the Equipment is delayed and amount of excise duty and/ or sales tax/ VAT on the day of dispatch is higher than the amount applicable on the scheduled delivery date, the amount applicable on the scheduled delivery date will be payable.

10.4. The price for installation and commissioning shall be inclusive of all taxes and duties except Service Tax. Installation and commissioning charges should be quoted on Lump sum basis. No such variables should be used due to which offer value can't be determined. Service tax on installation and commissioning, if applicable, will be payable extra.

10.5. Any other taxes and duties payable as extra to the quoted price shall be specifically stated in the Offer. The Purchaser will not be liable for payment of taxes and duties not specifically mentioned in the Offer.

10.6. No free conveyance or accommodation to erection staff for site job will be provided by BHEL.

10.7. Fixed price

10.7.1. Prices quoted by the bidder shall be fixed and not subject to any variation whatsoever during the period of Bid validity and execution of the Purchase Order. A Bid submitted with an adjustable price will be treated as non - responsive and rejected.

10.7.2. Prices shall be written in words and figures. The discrepancy in quoted price, if any, shall be corrected as follows:

- If there is a discrepancy between words and figures, the amount given in words shall prevail.
- If there is a discrepancy between the unit price and total price which is obtained by multiplying the unit price and quantity, the unit price shall prevail.
- If there is a discrepancy between the sub-total price and total price which is obtained by adding the various sub-total prices, the sub-total price shall prevail.
- The Order will be issued on the corrected price or the quoted prices for the complete scope of work (whichever is lower).

10.8. Bid currency

10.8.1. Indian bidders should quote the prices only in Indian Rupees.

10.8.2. Foreign bidders may quote the prices in their home currency, US Dollars or Euros (any one) and Indian Rupees.

10.9. Taxes and Duties

10.9.1. All Taxes and Duties payable as extra to the quoted price should be specifically stated in offer. Purchaser will not be liable for payment of Taxes and Duties not specifically mentioned in the offer.

11. DELIVERY

11.1. Bidders are required to quote their best delivery period.

11.2. Foreign Bidders should submit their offer on FOB Nearest Sea Port & FCA Nearest Air Port basis as per Incoterm 2000 for foreign supplies and on FOR dispatching station basis for indigenous supplies.

11.3. Indian Bidders should submit their offer on FOR dispatching station basis including packing, forwarding , freight & transit insurance.

11.4. Delivery shall be counted from the date of Letter of Intent.

11.5. The title of goods shall pass on to the Purchaser on FOB Nearest Sea Port / FCA Nearest Air Port for foreign goods and on FOR dispatching station dispatch for domestic goods.

12. COMPLETENESS OF THE EQUIPMENT

12.1. The Equipment shall be complete in every respect with all mountings and testing and fixtures and standard accessories, which are normally supplied. The Supplier shall not be eligible for extra payment in respect of such mountings, fittings, fixtures and accessories which are needed for efficient and safe operation of the Equipment.

12.2. All similar components or parts of similar equipment supplied by the Seller shall be interchangeable with one another.

13. TOOLS, CONSUMABLES AND SPARE PARTS

13.1. The Tenderer shall provide installation, commissioning and maintenance tools and tackles at no additional cost, unless otherwise stated in the Tender Documents.

13.2. The Tenderer shall provide commissioning spares and consumables at no extra cost to the Purchaser.

13.3. Mandatory/ recommended spares for two years operation shall be quoted item wise.

14. TAXES AND DUTIES ON INSTALLATION & COMMISSIONING:

14.1. Service Tax

14.1.1. The Service Tax on installation & commissioning services as applicable for this Contract will be paid by Purchaser separately. Therefore, contractor's price/ rates shall be exclusive of service tax on output services.

14.1.2. The Indian Contractor shall submit to Purchaser documentary evidence of service tax registration and remittance records of such tax immediately after depositing the tax with the concerned authorities. Contractor shall obtain prior written consent from Purchaser before billing the amount towards such taxes.

14.1.3. In case the Purchaser is asked to deduct any such tax and deposit the same with the appropriate authorities, the proof of such payment shall be provided to the Contractor. However, any penalty etc for any default by the Contractor imposed by the authorities shall be the sole responsibility of the Contractor.

14.2. Works Contract Tax

14.2.1. Although it is expected that the works contract tax will not be applicable as per laws in force in UP state, the Contractor shall make himself fully aware of the taxation requirements and take appropriate steps for complying with the regulations such as registering with the sales tax authorities of the state and paying the required tax, if applicable. Deduction of tax at source shall be made by the Purchaser, if required by law.

14.2.2. Contractor has to make his own arrangement at his cost for completing the formalities, if required, with Sales Tax Authorities, for bringing their materials, plants, and equipment at site for the execution of the work under this Contract and their return after execution of the work to the satisfaction of the Purchaser.

14.3. Income Tax

14.3.1. Income Tax at the prevailing rate on gross value of work done and applicable surcharge/ cess shall be deducted from the bills as per relevant rules unless exempted by the Income Tax Authorities.

15. NEW TAXES/ LEVIES

15.1. In case the Indian Government (Central/ State) imposes any new tax/ levy on the output services/ goods / work after the award of work, the same shall be reimbursed by BHEL at actuals. All necessary documents as required by BHEL shall have to be provided by the Contractor. However, in the event of delay in work execution attributable to the Contractor, the new taxes/ levies imposed during the delay period shall not be reimbursed to the Contractor.

15.2. In case any tax/levy/duty etc becomes applicable after the date of Bidder's offer, the Bidder/ Contractor must convey it's impact on his price duly substantiated by documentary evidence in support of the same before opening of the Price Bid. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

15.3. No reimbursement on account of increase/ decrease in the rate of taxes, levies, duties etc on input (goods/ services/ work) shall be made. Bidder has to make his own assessment of the impact of future variation if any, in rates/ duties/ levies etc in his price bid.

15.4. Tax Deduction at Source

15.4.1. Installation and commissioning charges will be released after deduction of Income Tax as per the Govt. of India

rules in force. The Tax Deduction at Source (TDS) certificate will be issued by BHEL. Service Tax on E&C charges will be payable extra, if applicable. The liability of depositing the same to the Govt. will be of the Supplier.

15.5. MODVAT credit (for Indian Bidders only)

15.5.1. The price bid must indicate Tariff item number and rate of Excise Duty applicable. The original Excise Duty Gate Pass will be required to be furnished in case charged to us. If the Vendor is availing MODVAT credit for his input materials, the effect of proforma credit should be passed on to the Purchaser.

15.6. Bank Charges

15.6.1. All bank charges for negotiation of documents through bank shall be to the account of the Seller.

15.6.2. No interest, whatsoever, shall be payable by Purchaser on the security deposit, any bank guarantee submitted or any amount due to the Seller by the Purchaser.

16. INVOICES AND PAYMENT DOCUMENTATION

16.1. Invoices shall be issued by the Supplier in the name of the Purchaser.

16.2. The invoices shall contain the following information:

i) Item Description
ii) Item no & quantity as per Purchase Order.
iii) Gross amount payable and net amount payable.

16.3. The following documents shall be presented by the Supplier to the Purchaser for drawing payment:

i) Signed Commercial invoice in quadruplicate.
ii) Clean on board Bill of Lading/ Airway Bill (for foreign Suppliers)/ LR (or equivalent document for Indian Suppliers)
iii) Packing list indicating dimensions of each case / bundle / piece shipped, with weight and number of items it contains.
iv) Manufacturer's Inspection / Test certificate
v) Certificate of Country of Origin, issued by an independent third party like Chamber of Commerce (for foreign Suppliers).
vi) Manufacturer's Guarantee / Warrantee certificate as per Purchase Order.
vii) Declaration by the Supplier certifying that the contents in each case are not less than those entered in the invoices / packing list and that the invoicing for the supplies effected is strictly in accordance with agreed rates as stipulated in the Purchase Order.
viii) Certificate from shipping company or its agent that the vessel is seaworthy and approved by Lloyds / Classification Societies / General Insurance Corporation of India (for foreign Suppliers).

16.4. For foreign supplies, all documents shall show Purchase Order No and date, Import License No and date (if any) and Letter of Credit No and date. Loading on deck and trans-shipment will not be allowed.

16.5. The complete equipment shall be despatched in one lot. If, for any reason, a Vendor wants to despatch the equipment in more than one lot, it shall be only after written approval of the Purchaser. For this purpose, the Vendor shall submit to Purchaser a detailed list of items proposed to be despatched in various lots with price break-up for approval of the Purchaser.

16.6. Detailed procedure for preparation and submission of payment documentation will be provided by the Purchaser at a later stage.

17. SECURITY DEPOSIT CUM PERFORMANCE BANK GUARANTEE :

17.1. Security deposit (SD) cum Performance Bank Guarantee (PBG) for 10% basic value of the order (excluding taxes & duties) for execution of the purchase order (PO) & satisfactory Performance of the equipment up to Guarantee period of 12 months with a further claim period of 3 months. This BG is to be submitted within 15 days of issue of LOI and PO will be released after receipt of this BG only. In case of failure of its submission within 15 days, we may cancel the order. The BGs shall be established through a nationalised bank in India acceptable to the Purchaser. Co operative Bank guarantee is not acceptable to us. All charges for establishing and amending the BGs, if necessary, shall be to Vendor’s account. After issue of LOI, we will be having

this BG of 10% value covering delivery period & 12 months from commissioning date. No separate PBG will be taken.

17.2. This BG requirement is mandatory. if it is not accepted, the offer may be bypassed without any further intimation.

18. EQUIPMENT GUARANTEE

The Equipment shall be guaranteed by the Vendor for a period of 12 (twelve) months from the date of acceptance of the Equipment by the Purchaser or 18 months from the date of despatch. This requirement is mandatory, if it is not accepted, the offer may be bypassed without any further intimation.

19. PENALTY FOR DELAY

19.1. The delivery of Equipment shall be made within the time prescribed. Failure to dispatch the Equipment in time as per the delivery specified above would make the Vendor liable to an un-conditional penalty at the rate of one half percent (1/2%) of the Basic Order value for delay of each week (or part thereof) subject to a maximum of fifteen percent (15%) of the Order Value.

19.2. The installation & commissioning of the Equipment shall be completed within the time prescribed. Failure to complete the work as per the time specified above would make the Vendor liable to an un-conditional penalty at the rate of one half percent (1/2%) of the Order value for delay of each week (or part thereof) subject to a maximum of fifteen percent (15%) of the Order Value.

19.3. However, if the supply of Equipment is delayed and the work of installation & commissioning of the machine is completed ahead of schedule, the penalty for delay will be reduced to the extent of the time saved during installation & commissioning.

20. RISK PURCHASE

20.1. If the Vendor is found to be not in a position to execute the Order in time, the Purchaser, at his option, will be entitled to terminate the Contract and to purchase and/or complete the work from elsewhere at the risk and cost of the Vendor either the whole of the goods or any part which the supplier has failed to deliver/ despatch or complete the work within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefore.

21. PURCHASER'S RIGHT OF REJECTION

21.1. Not withstanding any approval which Purchaser or the Engineer may have given in respect of the Equipment or any materials or other particulars or the work or workmanship involved in the performance of the Contract (whether with or without any test carried out by Seller or the Inspection Agency or under the direction of the Contract Engineer), and notwithstanding delivery of the Equipment where so provided to the Purchaser, the Purchaser shall be entitled to reject the Equipment or any part, portion or consignment thereof, if such Equipment or part, portion of consignments thereof is not in all respects in conformity with the terms and conditions of the Contract whether on account of any loss, storage, deterioration or damage before dispatch or delivery or during transit or otherwise, whatsoever.

21.2. Rejected goods or materials shall be removed by the Seller from the Site. The expenses to be incurred in respect thereof shall entirely be borne by the Seller.

22. INSURANCE

22.1. Transit insurance for all supplies shall be arranged by the Purchaser. However Vendor shall inform the Purchaser well in advance the despatch details before despatch of Equipment to enable Purchaser to arrange the insurance.

22.2. Purchaser shall also arrange for insurance of the Equipment and materials covering the risk during storage, installation and commissioning at Site.

SHORT SHIPMENT / GUARANTEE REPLACEMENT

22.3. Any shortages or damages during transit, transportation or handling at site, including at the time of installation and commissioning, shall be made good by the Seller/Contractor at his risk and costs, to meet the project schedule. In case of faults/discrepancies in any material, component, sub-assembly, assembly, etc., the same shall be supplied/ replenished free of

cost to enable the equipment to be put in service. Shortages in sound cases shall also be replenished free of cost.

22.4. In case of foreign supplies, customs duty (including any other duties and surcharges) levied in India on such supplies shall be borne by the Vendor. All such supplies shall be on FOR, BHEL Works basis and all taxes and duties shall be borne by the Vendor.

22.5. Any replacements during the guarantee period shall be on FOR, BHEL Works basis and all taxes and duties (including customs duty) shall be borne by the Vendor.

23. INSPECTION AND TESTING

23.1. The Engineer/Inspector shall have at all reasonable time, access to the Supplier's premises or Works and shall have the power at all reasonable times to inspect drawings or any portion of the equipment / plant or examine the materials and workmanship, during its manufacture and if parts of the plant is being manufactured in other premises, the Supplier shall obtain permission for the Engineer/Inspector permission to inspect such equipment.

23.2. The Supplier shall give the Engineer/Inspector 21 day's written notice of Equipment being ready for testing. Such tests shall be to the Supplier's account except for the expense of the Inspector and the Engineer/Inspector. Unless the inspection of the tests is virtually waived, the Inspector /Engineer shall attend such tests within 21 days of the date on which the plant is notified as being ready, failing which visit, the Supplier may proceed with the tests which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of the tests in triplicate. The equipment on which witnessing of tests is required, shall be mutually identified and agreed.

23.3. When the factory tests have been completed at the works of the Vendor or Sub-Vendor, the Engineer/Inspector shall issue a certificate to this effect within fifteen days after completion of tests. If the tests are not witnessed by the Engineer/Inspector, the certificate shall be issued after receipt of the Supplier's test certificate by the Engineer/Inspector. The completion of these tests or issue of the certificate shall not bind the Purchaser to accept the equipment should it, on further tests after installation, be found not to comply with the Contract.

24. PACKING

24.1. The Supplier shall include and provide for secure protection and packing for the Equipment so as to avoid damages in transit to Site under proper conditions and he shall be responsible for all losses or damages caused or occasioned by any defect in packing.

24.2. The Equipment shall be packed in suitable strong cases wherever essential. Large article such as bed plates which are not packed in cases, shall have all screwed holes plugged suitably and machined surfaced properly protected.

24.3. Weight and dimension limitation for transport shall be followed.

25. QUALITY OF MATERIALS

25.1. The plant shall be manufactured and constructed in the best workman like manner and with materials of the best or of approved qualities for their respective uses.

25.2. A Quality Assurance Plan shall be submitted by the Vendor to the Purchaser giving details of manufacturing and testing standards and procedures for major equipment for his approval.

25.3. Vendor shall purchase the bought out items only from vendors of repute and indicate the same to the Purchaser at the time of approval of drawings. Purchaser reserves the right to approve/ reject such vendors and visit / inspect the works of vendors and that of their sub-contractors before or after placement of order.

26. DESIGN IMPROVEMENT

26.1. The Inspector or the Supplier may propose changes in the specification of the Equipment or quality thereof and if the parties agree upon any such changes the specifications shall be modified accordingly.

26.2. If any such agreed upon change is such that it affects the price or delivery, the parties shall agree in writing as to the extent of any change in the price and/or delivery or both, before the Supplier proceeds with the change.

27. DRAWING / DATA APPROVAL

27.1. Any drawing / data approval required from BHEL after placement of order shall be the responsibility of the Vendor and any delay on account of the same shall be the responsibility of the Vendor and will have no bearing on delay in delivery or applicable penalty.

28. ACCEPTANCE OF EQUIPMENT

28.1. The Equipment will be accepted by the Purchaser after installation, testing and commissioning of the Equipment at Site and after completion of following activities.

28.1.1. All components and sub-assemblies of the Equipment have been properly assembled and tested.

28.1.2. All facilities necessary for the safe and reliable operation of the Equipment have been properly installed and adjusted.

28.1.3. The equipment can be safely placed in operation for its intended use.

28.1.4. Spares, service tools and manuals have been delivered to the Purchaser.

28.1.5. On site training of the Purchaser's personnel have been completed as per Contract.

28.2. A letter of Acceptance of Equipment shall be issued by the Site Engineer after acceptance of the Equipment.

28.3. The guarantee period of the Equipment will start from the date of acceptance of Equipment by the Purchaser.

29. USE OF DRAWING/ DESIGN INFORMATION

29.1. The Vendor shall undertake that the drawings / design / Information enclosed with the Tender / Order or sent to him subsequently is the property of BHEL and it will not be parted to any other agency and will also not be used for any purpose detrimental to the interests of BHEL.

30. PERFORMANCE GUARANTEE

30.1. The Supplier guarantees that the Equipment will be new and in accordance with the specifications; that the Equipment will be free from defects in material and workmanship; and that the Equipment will meet the specified performance parameters

30.2. For the guarantee period the Supplier shall be liable to repair or replace any defective parts that may develop in the Equipment of his own manufacture or those of his sub-Suppliers under conditions arising from faulty design, materials or workmanship; provided that notice of any such defects or failure to conform to the specifications is promptly given within 30 days by the Purchaser to the Supplier.

30.3. The acceptance of the plant by the Engineer shall, in no way, relieve the Supplier of his obligation under this clause.

30.4. In the case of defective parts not repairable at site but essential in the meantime for commercial operation of the plant, the Supplier and Purchaser shall mutually agree to a programme of replacement or renewal which will minimise, to the maximum extent, interruption in the operation of the Equipment.

30.5. If it becomes necessary to replace or renew any defective parts under this clause, the provisions of this clause shall apply to replaced part until 6 months from the date of replacement or until the expiration of original guarantee, whichever is later.

30.6. Guarantee period for the Equipment shall be as specified in the Special Conditions of Contract.

31. PROGRESS REPORTS

31.1. The Supplier shall furnish to the Purchaser Progress Reports of the equipment manufactured at the end of every months as per mutually agreed format.

32. COOPERATION WITH OTHER VENDORS

32.1. The Supplier shall agree to co-operate with the Purchaser's other suppliers and consulting engineers for associated equipment and freely exchange with them such technical information as is necessary to obtain the most efficient and economical design and to avoid unnecessary duplication of equipment. No remuneration shall be claimed from the Purchaser for such technical co-operation. The inspector shall be provided with two copies of all correspondence addressed by the Supplier to other Suppliers in respect of such exchange of technical information

33. FORCE MAJEURE

33.1. Notwithstanding anything contained in this Contract, neither the Supplier and nor the Purchaser shall be held responsible for total or partial non-execution of any of the contractual obligations, should the obligation be made impossible due to concurrence of a Force Majeure which will include war, military operations of any nature, blockages, revolutions, insurrections, riots, civil commotion's, insurgency, sabotage, act of public enemy, acts of god, epidemics and act of Govt. over which the Suppler or Purchaser has no control.

34. ARBITRATION

34.1. The Purchaser and Supplier shall settle the disputes and differences arising out of this agreement in good faith. In the event that a dispute can not be resolved within reasonable time, the parties agree that the agreement shall be subject to arbitration under the Indian Arbitration & Conciliation Act 1996. Notwithstanding anything to the contrary in such rules there shall be three arbitrators, one appointed by the Purchaser, one appointed by the Supplier and the third appointed by the other two arbitrators. No aspect of any arbitration proceedings shall be made public by either party. The arbitration tribunal shall give reasonable award in writing. The award of the arbitration tribunal shall be final and binding on the parties. Any disputes under this order shall be under jurisdiction of Tiruchirappalli Courts only.

35. CONTRACT LAW AND JURISDICTION

35.1. This Contract shall be governed by the laws of India.

35.2. No court shall entertain or try any suit or legal proceedings to enforce any claim arising out of the Contract except in a court of law having jurisdiction at New Delhi.

36. GUIDELINES REGARDING DEALINGS WITH INDIAN AGENTS OF FOREIGN SUPPLIERS

39.1 BHEL shall deal directly with the foreign original equipment manufacturers (OEM) Foreign Principal, for all its purchases which are imported.

39.2 Wherever the foreign OEM / Principal desires to avail the services of an Indian Agent, the dealings with Indian Agents are to be regulated.

DEFINITION OF INDIAN AGENT

39.3 An Indian Agent of foreign principal is an individual, a partnership, an association of persons, a private or public Company, that carries out specific obligation(s) towards processing of BHEL tender or finalization or execution of BHEL's contract on behalf of the foreign supplier.

39.4 TERMS REGARDING INDIAN AGENTS OF FOREIGN PRINCIPALS:

i. BHEL shall deal directly with foreign· vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines which require mandatory submission of an Agency Agreement.

ii. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of

India, issued from time to time.

iii. The Agency Agreement should specify the precise relationship between the foreign OEM Foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier! Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.

iv Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.

v. Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.

vi. In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives! associate! consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.

vii. The "Guidelines for Indian Agents of Foreign Suppliers" enclosed at annexure -'A' shall apply in all such cases.

viii. The supply and execution of the Purchase Order (including indigenous supplies/ service) shall be in the scope of the OEM/ foreign principal. The OEM/ foreign principal should submit their offer inclusive of all indigenous supplies/ services and evaluation will be based on 'total cost to BHEL'. In case OEM/ foreign principal recommends placement of order(s) towards indigenous portion of supplies/ services on Indian supplier(s)/ agent on their behalf, the credentials/ capacity/ capability of the Indian supplier(s)/ agent to make the supplies/ services shall be checked by BHEL before opening of price bids. In this regard, details may be checked as per Annexure-B (copy enclosed).

The responsibility for successful execution of the contract (including indigenous supplies/ services) lies with the OEM/ foreign principal. All bank guarantees to this effect shall be in the scope of the OEM/ foreign principal.

Annexure-A

Guidelines for Indian Agents of Foreign Suppliers

1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BHEL shall apply for registration in the registration form in line with SEARP.

1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/ salary/ retainership being paid by the principal to the agent before the placement of order by BHEL.

1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.

2.0 **Disclosure of particulars of agents representatives in India, if any.**

2.1 Tenderers of Foreign nationality shall furnish the following details in their offers:

2.1.1 The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the agents/ representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.

2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/representatives in India.

2.1.3 Confirmation of the Tenderer that the commission/remuneration, if any, payable to his agents/representatives in India, may be paid by BHEL in Indian Rupees only.

2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:

2.2.1 The Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/ representatives.

2.2.2 The amount of commission! remuneration included in the price (s) quoted by the Tenderer for himself.

2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BHEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.

2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.

2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.

Annexure-**B**

This format is applicable only to Indian Suppliers/Agents supplying indigenous portion of Foreign Purchases.

Clause No.	**Detail**
	Name & address of the firm
1.0	**Products/Systems/Services being considered for**
2.0	**General Information**
2.1	Name of the chief Executive
2.3	Details of authorized signatory
3.0	**Ownership Information**
3.1	Type of firm
3.2	Nature of Business • Attach **authorization letter** and **agency agreement** from Principal (from whom capital equipment is procured) • Attach copy of declaration from Foreign Principal for total **guarantee/warranty of indigenous supplies**
3.3	Year of establishment
3.4	Year of commencement of business
4.0	**Registration particulars**
4.1	Permanent Account No.
4.2/4.3	Sales Tax/Tin No.
4.6	Service Tax No. (incase of E&C)
5.0	Organization strength
6.0	Other particulars
6.1	If the company is already registered with other units
6.2	Directors/Partners, if related to any BHEL Employee
6.9	If any Ex BHEL personnel employed by the company
6.12	Details of pending legal issues with BHEL
6.13	Bank Account information

Annexure-2

	Commercial Terms & Conditions Format - PART- I	
		Please tick whichever is applicable or delete which is not acceptable
1	Packing & Forwarding Charges / FOB charges (if any)	
2	Present rate of Excise duty (if any)	
3	Present rate of sales tax, VAT/CST (Not applicable for foreign suppliers)	
4	a. Shortest Delivery period in No. of Weeks from date of letter of intent (LOI) for supply of equipment , **(Pl note after expiry of this period, penalty due to late delivery will be applicable)**	No of days or weeks
	b. Erection/ Installation and commissioning period from receipt of material at Tiruchirappalli ,**(Pl note after expiry of this period, penalty due to late delivery will be applicable)**	No of days or weeks
	c. Drawing submission time if drawing approval is linked with delivery period	No of days or weeks
5	Present rate of Service Tax on Labour charges (if any)	
6	Late delivery clause 20 of terms and conditions	Accepted / Not accepted
7	Risk & cost purchase as well as other conditions given in general Terms & conditions and Standard Enquiry terms & conditions are acceptable to us.	Accepted / Not accepted
8	Rates quoted in the price bid are on FOR Tiruchirappalli for Indian suppliers or on/ FOB basis for foreign suppliers.	Accepted / Not accepted
9	Validity of the rates quoted is 6 months from the date of opening of Tender	Accepted / Not accepted
10	Prices have been quoted on "FIRM PRICE" basis only.	Accepted / Not accepted
11	Security deposit (SD) cum Performance Bank Guarantee (PBG) for 10% basic value of the order (excluding taxes & duties) for execution of the purchase order (PO) & satisfactory Performance of the equipment up to Guarantee period of 12 months with a further claim period of 3 months before release of PO will be submitted.	Accepted / Not accepted
12	The equipment shall be guaranteed for 12 months from the date of acceptance by BHEL irrespective of date of supply or installation.	Accepted / Not accepted
13	Copy of Unpriced Price Bid (in Part-A) & Price Bid (in Part-B) are submitted as per BHEL formats	Yes/ No

Note-1 If Condition No. 11&12 are not accepted, the offer may be bypassed without any further intimation.

Note-2: Commercial terms and conditions mentioned in above format will be considered as final. If these conditions are given elsewhere then they will not be considered. In case of ambiguity, conditions mentioned in BHEL format will prevail

Check List for Commercial Terms and Conditions
(To be filled and submitted along with Offer)

Sr. No.	DESCRIPTION OF BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY VENDOR	REMARKS / DEVIATION
1	Technical confirmation to BHEL's Specification as called for in BHEL Format is furnished.		
2	Prices have been quoted item wise only as per the specification		
3	Prices have been quoted on "FIRM PRICE" basis only.		
4	Installation & commissioning charges have been mentioned in the offer IF ANY.		
5	Confirmation that the Equipment ordered will be inspected and proved at vendor's works prior to dispatch. However final inspection and acceptance of equipment will be after installation at BHEL, Tiruchirappalli.		
6	Confirmation that the vendor shall provide necessary drawings, Test Certificates and Operating Maintenance Manuals etc., as called for in the Technical Specification, in the required number of copies at no extra cost.		
7	Any other point:		

NOTE: -

It is confirmed that all the terms and conditions stipulated in the Tender Enquiry have been fully understood by us and all clarifications & details have been obtained.

Signature & Office Seal of the bidder

CHECK LIST

NOTE:- Tenderers are required to fill in the following details and no column should be left blank

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3	Details of Contact person for this Tender	Name : Mr/Ms Designation: Email : Telephone No: Mobile No: Fax No:	
4	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY	BIDDER REPLY
5	Whether the format for compliance with specification and commercial terms and conditions is understood and filled with proper supporting documents referenced in the specified format	Applicable / Not applicable	YES / NO
6	Copy of PAN Card	Applicable / Not applicable	YES / NO
7	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable / Not applicable	YES / NO
8	Declaration by Authorised Signatory	Applicable / Not applicable	YES / NO
9	No Deviation Certificate	Applicable / Not applicable	YES / NO
10	Declaration confirming knowledge about Site Conditions	Applicable / Not applicable	YES / NO
11	Non Disclosure Certificate	Applicable / Not applicable	YES / NO
12	Bank Account Details for E-Payment	Applicable / Not applicable	YES / NO

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)