



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY

NOTICE INVITING TENDER

Phone: +91 431 257 79 38
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Email : tvenkat@bheltry.co.in
Web : www.bhel.com

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2621100080	15.04.2011	16.05.2011

You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both **delayed offer** and **late offers** will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of **tender opening**.

Item	Description	Delivery Schedule	
		Quantity	Date
10	Design, Fabrication, Supply, Erection and Commissioning of 1 x 13 Kilo Litre Liquid Oxygen Storage Vessel, Vapourizer, Safety System, etc. All Conforming to the standards mentioned as per Statutory Authorities against each item on Establishing Facilities as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1.00 No	15.08.2011

Important points to be taken care during submission of offer

1. Material shall be delivered to
Indigenous Vendors:
FOR, BHEL, Stores
Power Plant Piping Unit
Thirumayam
Pudukkottai Dist.
2. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
3. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer MM/CE/GT/001) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "2621100080".

Tenders should reach us before 14:00 hours on the due date
Tenders will be opened at 14:30 hours on the due date
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

Sr. Manager / Capital Equipment / MM

DESIGN, FABRICATION, SUPPLY,TRANSPORTATION , ERECTION, COMMISIONING-
1X13 KL LOX STORAGE FACILITY AT BHEL/ THIRUMAYAM/PUDUKOTTAI
(DIST)/TAMIL NADU

Sl.No	Description	BHEL Specication	Vendor's Offer	Deviation If any, vendor to be filled
1.0	NAME OF WORK	DESIGN , FABRICATION ,SUPPLY , ERECTION & COMMISSIONING OF 1 X 13 KL LIQUID OXYGEN STORAGE VESSEL , VAPOURIZOR, SAFETY SYSTEM , Etc. ALL CONFORMING TO THE STANDARDS MENTIONED AS PER SATUTORITY AUTHORTIES AGAINST EACH ITEM ON ESTABLISHING FACILITIES		
2.0	BRIEF DESCRIPTION OF WORK	M/s. BHEL / Tiruchy has proposed to set up 1 x 13 KL LOX STORAGE FACILITY in the premises of BHEL , at THIRUMAYAM to meet day to day OXYGEN GAS requirement at a pressure of 5 to maximum 27 Kg/sq.cm at user point through new pipeline with pressure regulation valve for a capacity of 500 kg per hour with 1 x 500 Kg/ hr of vaporizer with required piping, valves, fittings, gauges, vents, drains and other accessories including fencing & fire fighting items as per the requirement of statutory authority and for the operational & maintenance convenient.		
3.0	SCOPE OF SUPPLY			
3.1	LOX STORAGE VESSEL AND ACCESSORIES	Quantity : 1 Set Consists of following items as per		

		sl.No. 3.1.1 to 3.1.9.		
3.1.1	LOX Bullet with fittings	1 No.		
3.1.2	Vaporiser unit	1 No.		
3.1.3	Pressure Regulating system	2 Nos		
3.1.4	Complete piping & Fittings inside storage yard	1 Lot		
3.1.5	Fire Fighting equipments	1 Lot		
3.1.6	Fencing materials for storage yard	1 Lot.		
3.1.7	Structural materials	1 Lot		
3.1.8	Foundation Bolts ,Washers Nuts	1 Lot		
3.1.9	Spares reqd for two years	1 set		
4.0	STORAGE VESSEL			
4.1	TYPE	VERTICAL, CYLINDRICAL, DOUBLE WALL,VACUUM + PERLITE INSULATION		
4.2	NET LIQUID OXYGEN STORAGE CAPACITY	13 KL		
4.3	Gross volume	Vendor to specify		
4.4	Fluid	Liquid Oxygen		
4.5	Working Pressure	24 Kg/Cm ² (g)		
4.6	Design Code	ASME Design to be followed and Vendor to specify		
5.0	INNER VESSEL			
5.1	Material specification (Stainless steel)	Vendor to specify		
5.2	Gross volume of Inner Vessel	Vendor to specify		
5.3	Net Liquid Storage Capacity	Vendor to specify		
5.4	Design & Manufacturing Code	Vendor to specify		
5.5	Max. Allowable Working Pressure	Vendor to specify		
5.6	Design Pressure (Corrected For Vacuum)	Vendor to specify		
5.7	Hydrostatic Test pressure	Vendor to specify		
5.8	Design Temperature	Vendor to specify		
5.9	Max .Withdrawal Flow Rate	Vendor to specify		
5.10	Radiographic Control	100 % X-Ray For Inner Tank		
5.11	Insulation	Fine Grain Perlite + Vacuum		
5.12	Vacuum Value	Vendor to specify		

6.0	OUTER VESSEL			
6.1	Material specification (Carbon steel)	Vendor to specify		
6.2	Design Code	Vendor to specify		
6.3	Operating Pressure	Vendor to specify		
6.4	Design Pressure	Vendor to specify		
6.5	Hydrostatic Test pressure	Vendor to specify		
6.6	Design & Manufacturing Code	Vendor to specify		
7.0	VALVES AND FITTINGS			
7.1	Lower filling valve	Vendor to specify		
7.2	Upper filling valve	Vendor to specify		
7.3	Pressurizing valve	Vendor to specify		
7.4	Liquid delivery valve	Vendor to specify		
7.5	Stop valve (Pressurizer)	Vendor to specify		
7.6	Flow divertor valve	Vendor to specify		
7.7	Gas blow valve	Vendor to specify		
7.8	Liquid level detect valve	Vendor to specify		
7.9	Liquid charging line blow valve	Vendor to specify		
7.10	Inlet check valve	Vendor to specify		
7.11	Cryoregulator (combined function) consists of following component (a to d)	Vendor to specify		
	a) Pressure build-up regulator	Vendor to specify		
	b) Non return valve	Vendor to specify		
	c) Economizer	Vendor to specify		
	d) Safety relief system	Vendor to specify		
7.12	Safety valves for inner vessel (2Nos.)	Vendor to specify		
7.13	Safety valve for pipe line	Vendor to specify		
7.14	Level gauge valves (2Nos.)	Vendor to specify		
7.15	Pressure balance valve	Vendor to specify		
7.16	Level gauge	Vendor to specify		
7.17	Pressure gauge	Vendor to specify		
7.18	Vacuum probe valve	Vendor to specify		
7.19	Evacuation port	Vendor to specify		
7.20	Auxiliary liquid valve	Vendor to specify		
7.21	Auxiliary gas valve	Vendor to specify		
7.22	Rupture discs (2Nos.)	Vendor to specify		
7.23	Safety device for outer vessel (Lift off plate)	Vendor to specify		
7.24	Filling joint (Flange	Vendor to specify		

	SORF, ANSI B16.5, 300#)			
7.25	Pressure build-up coil (SS 304 fin tube)	Vendor to specify		
7.26	Mfg Std & MOC for all valves	All valves shall be SS materials & vendor to specify Mfg Std & MOC		
8.0	OVERALL DIMENSION OF VESSEL			
8.1	Outside Diameter	Vendor to specify		
8.2	Overall Height	Vendor to specify		
9.0	WEIGHT of LOX VESSEL & FITTINGS			
9.1	Empty Weight [Approx]	Vendor to specify		
9.2	Full Weight(Approx) With Oxygen	Vendor to specify		
10.0	WELDING PROCESS:	Vendor to specify		
11.0	QUALITY PLAN & DRAWINGS;			
11.1	Flow Scheme Drawing.	To be furnished along with offer		
11.2	GA Drawing	To be furnished along with offer		
11.3	Foundation Drawing.	To be furnished along with offer		
11.4	The Bidder should arrange Quality plan for each work and get approved by Engineer concern.	Vendor to Confirm		
11.5	The Bidder shall follow relevant ASME section for Liquid Oxygen Storage System	Vendor to Confirm		
11.6	The Bidder should guarantee full capacity of Liquid Oxygen in the filled condition.	Vendor to Confirm		
11.7	The Bidder should furnish the maximum permissible evaporation losses , Liquid transfer losses of the proposed system.	Vendor to Confirm		
12.0	INSPECTION & TEST			
12.1	All test and inspection by	(a)All tests and inspections to be carried out under the control of third party . (b)List of CCOE approved third party inspecting		

		agencies to be provided for BHEL approval		
12.2	Checking & approval of design and calculations	Vendor to Confirm		
12.3	Material inspection and stamp transferring separately	Vendor to Confirm		
12.4	Visual & dimensional inspection	Vendor to Confirm		
12.5	Plate orientation	Vendor to Confirm		
12.6	Radiographic control	Vendor to Confirm		
12.7	Hydrostatic test	Vendor to Confirm		
12.8	Vacuum test	Vendor to Confirm		
12.9	Inspection of valves and fittings	Vendor to Confirm		
12.10	Any other inspection and test required	To be mentioned by offerer		
13.0	INSPECTION REPORTS AND TEST CERTIFICATES	The reports of the all tests & inspections with the inspection certificates of the tank to be submitted to BHEL after the completion of the tank & the inspections by third party inspecting agency and as per sl.No.13.1 to 13.24		
13.1	Hydro test report/certificate of inner vessel	Vendor to confirm		
13.2	Calibration chart	Vendor to confirm		
13.3	safety valve manufacturer Test certificate	Vendor to confirm		
13.4	Burst disc certificate	Vendor to confirm		
13.5	Test certificate for pressure building coil	Vendor to confirm		
13.6	Valves certificates	Vendor to confirm		
13.7	Regulator certificate	Vendor to confirm		
13.8	Component certificates(test & calibration certificates) (DP GAUGE& PR.GAUGE)	Vendor to confirm		
13.9	Fitting test certificate(Thermal relief valve)TRV,NEEDLE VALVE ,FLOW DIVERTOR)	Vendor to confirm		
13.10	LRS/BVS Report stamp	Vendor to confirm		

	transfer (Lloyd's Register of shipping/ bureau Veritas Industrial services)			
13.11	Vacuum sealing & retention report (for Evacuated container).	Vendor to confirm		
13.12	Material identification report-inner vessel (inner shell, dish end, Nozzles, inner pipes)	Vendor to confirm		
13.13	Material identification report-outer vessel	Vendor to confirm		
13.14	Radiography chart for inner vessel	Vendor to confirm		
13.15	Radiography chart for outer vessel	Vendor to confirm		
13.16	Performance test for NER/ cold spot /pressure test of vessel report(whichever applicable)	Vendor to confirm		
13.17	MSLD Report of outer vessel	Vendor to confirm		
13.18	MSLD Report of inner vessel (Value of std leak, acceptable leak rate, leak rate observed, vacuum level in vessel etc0	Vendor to confirm		
13.19	UV Test report for cleanliness	Vendor to confirm		
13.20	Stage inspection report – inner (Nozzle& weld set up)	Vendor to confirm		
13.21	Stage inspection report – outer (Nozzle& weld set up)	Vendor to confirm		
13.22	Heat treatment report for applicable items	Vendor to confirm		
13.23	UV Test certificates for inner surface of inner vessel including baffles/stiffner & ppg)	Vendor to confirm		
13.24	Inspection Reports by Third Party agency	Vendor to confirm		
13.0	CLEANING& PAINTING:			
13.1	Outer Vessel	Before painting for outer tank, the tank to be sand		

		blasted with sa 2,5 quality. Primer coat & polyurethane based white top coat to be applied providing a total thickness of minimum 120 microns.		
13.2	Inner Vessel	Inner tank cleaning to be done according AMSE std & vendor to specify.		
14.0	TANK VAPORISER			
14.1	Quantity	1 No.		
14.2	Type	AMBIENT, SS 304, FIN		
14.3	Material	SS 304		
14.4	Capacity	500 NM ³ /Hr		
14.5	Surface Area	Vendor to specify		
14.6	Working Pressure	24 Kg/cm ² (g)		
14.7	Design Pressure	26 Kg/cm ² (g)		
14.8	Hydrostatic Test Pressure	36 Kg/cm ² (g)		
14.9	Design Temperature	—196 °C / 50 °C		
15.0	PIPE LINES with in storage yard			
15.1	Pipes and fittings	The pipeline includes all the pipe fitting and pipe fittings such as Elbow, Tees Flanges, 'U' Clamp, Stud Nuts, Copper jumber, etc		
15.2	Material of Construction	A 312 SS 304		
15.3	Working Pressure	5 to 24 Kg/cm ² (g)		
15.4	Design Pressure	30 Kg/cm ² (g)		
15.5	Hydrostatic Testing Pressure	36 Kg/cm ² (g)		
16.0	PRESSURE REGULATING SYSTEM			
16.1	Quantity	2Sets.(1 working and 1 standby)		
16.2	Inlet Pressure	24 Kg/cm ² (g)		
16.3	Outlet Pressure	5 TO 24 Kg/cm ² (g)		
16.4	Flow Rate	0 - 500 Kg/hr.		
16.5	Size	50 NB / Vendor to specify		
16.6	Ball Valve	50 NB / Vendor to specify		
16.7	Pressure Gauge	Vendor to specify , Make shall be Fiebig/wika/Bourden/Honey well		
16.8	POP Off Valve	Vendor to specify		
16.9	Make	Sensus/ Invensys/ Kromschoeder/ Fisher/ Honeywell or any other reputed make acceptable to BHEL		

17.0	GENERAL CONDITIONS			
17.1	As built process & instrumentation diagram.	Vendor to confirm		
17.2	Do's & Dont's	Vendor to confirm		
17.3	Material safety data sheet	Vendor to confirm		
17.4	Std operating procedure for warm filling	Vendor to confirm		
17.5	Std operating procedure for cryogenic storage vessel.	Vendor to confirm		
17.6	Liquid level Gauge calibration certificate & chart.	Vendor to confirm		
17.7	Volume equivalent chart.	Vendor to confirm		
17.8	Physical security arrangement.	Vendor to confirm		
17.9	Tank test certificate.	Vendor to confirm		
17.10	Emergency contact.	Vendor to confirm		
17.11	Tank document	Vendor to confirm		
18.0	STATUTORY REQUIREMENT	The Scope of the Tender includes assisting the site selection for Installation of LOX G Facility at B H E L , THIRUMAYAM IN PUDUKOTTAI DIST,TAMIL NADU. The Bidder should coordinate and obtain necessary clearance certificates with all Statutory bodies such as Explosives, Factory Inspectorate.etc., Charges on this account if any shall be indicated in the Price Bid separately & vendor to confirm.		
18.1	Bidder shall be in a position to design all Mechanical ,Electrical & Instrumentation equipment in the Liquefied Petroleum gas storage facilities . The Bidder shall take into consideration of all anchors parts , pipe lines, Excess flow valves,	Vendor to Confirm		

	<p>safety valves , isolation valves , regulating valves , line blinds, fittings and other miscellaneous equipment for the system to be in complete respect. The Bidder shall practice the most modern design and technology for the proposed system. The Bidder has to furnish general arrangement drawing with main components inner details such as storage tank , inner technical details including materials, Surface area ,etc.,</p>			
18.2	<p>The Bidder should arrange G A Drawing, Quality plan , P & I diagrams for each work and get approved by BHEL Engineer concerned. All the drawings shall be submitted in 3D form also.</p>	Vendor to Confirm		
18.3	<p>The Bidder should arrange for tank foundation obtaining construction approval CCOE / Nagpur .Selection , Inspection & despatch of material , Inspection / certification under Rule 33, Application and obtaining licences from C C O E / Nagpur , Inspection of Plant by Department of Explosive, Endorsement , Supply of documentation for the plant, Obtaining safety certificate from the competent authorities on</p>	Vendor to Confirm		

	completion of installation with in the licensed area , Training of our personnel in operation and maintenance are scope of the Bidder.			
18.4	Approval for manufacturing of lox bullet ,vapourisor unit & their accessories	Copy of approval certificate issued by ccoe for manufacturing of lox bullet ,vapourisor unit & their accessories to be enclosed		
18.5	Design approval	Design / Drawing approval for manufacturing & complete installation of LOX bullet&Vapourisoretc, from CCOE / Nagpur & Local CCOE to be obtaining .		
19.0	SAFE CUSTODY & PRESERVATION OF COMPONENTS			
19.1	The safe custody of storage vessel , Evaporator, Regulation system till commissioned and handed over will also under the scope of the contractor	Vendor to Confirm		
19.2	It is the responsibility of the supplier to apply touch up painting on all equipment before erection at his cost .	Vendor to Confirm		
19.3	Preservation of all equipment at all stages of handling, transporting to site of work or Pre Assy Yard , Pre - Assembly Erection, Testing, Commissioning , and till the unit is handed over to BHEL for regular operation.	Vendor to Confirm		
20.0	VENDOR'S BRIEF SCOPE OF SUPPLY	The Bidder should coordinate and obtain necessary clearance certificates with all		

		Statutory bodies such Explosives, Factory Inspectorate.etc., Charges on this account if any shall be indicated in the Price Bid separately in favour of BHEL.		
20.1	Supply, Installation and Commissioning of the entire system (as mentioned above specification) as per CCOE Norms and to Customer's Satisfaction.	Vendor to Confirm		
20.2	Scope restricted to Inside LOX Yard including Fire fighting system & Fenced Area.	Vendor to Confirm		
20.3	Providing and Laying Cables (Flame Proof) inside LOX Yard as per statutory requirement	Vendor to Confirm		
20.4	Providing all Technical Help required related to LOX Installation.	Vendor to Confirm		
20.5	Providing all related Drawings like P & I (Process & Instrumentation) and Layout Drawing, Complete Civil Drawings.	Vendor to Confirm		
20.6	Complete Initial Drawings Approval from CCOE (Chief Controller of explosives – Nagpur) & BHEL/Trichy.	Vendor to Confirm		
20.7	Complete 3rd Party Inspection for acquiring Rule for fabrication & installation of entire LOX facilities..	Vendor to Confirm		
20.8	Obtaining Final License from CCOE – Nagpur towards the Installation.	Vendor to Confirm		
20.9	Endorsement of the CCOE License from Local CCOE office.	Vendor to Confirm		
20.10	Training of operation &	Vendor to Confirm		

	maintenance staff of LOX facilities.			
20.11	Providing complete Guarantee Certificates / Product Manuals and Tank History file for project in 4 sets. (1 Original + 3 Xerox copy)	Vendor to Confirm		
20.12	Required consumables like cutting gases, welding electrodes for installation purposes .	Vendor to Confirm		
20.13	The crane facility required for unloading & installation of LOX SYSTEM at site	Vendor to Confirm		
20.14	From single point power source (Panel board) to all concerned Electrical items	Vendor to Confirm		
20.15	All electrical items shall be flameproof.	Vendor to Confirm		
20.16	Bidders shall deploy complete set of Tools & Plant for Erection, Testing Commissioning, and Hand over of the liquid LPG storage facility installation for regular operation.	Vendor to Confirm		
20.17	Fire fighting Equipments	Vendors to specify		
20.18	Spares required for two years for trouble free operation .	Vendors to specify		
21.0	BHEL SCOPE OF SUPPLY	Vendor to Confirm		
21.1	All civil work involved inside LOX Yard which includes Civil Pedestals for Tanks, Vaporizer Systems etc. will be carried out by BHEL for the entire Project and the required drawings details will have to be furnished by the Supplier to BHEL along with the offer or within two weeks of Purchase	Vendor to Confirm		

	Order. The civil drawing should indicate the dynamic loading or foundation details of the vessel foundation drawing. 4 Set of GA drawing with foundation details are needed.			
21.2	Providing single point Power source (Panel Board) to all concerned Electrical items	Vendor to Confirm		
21.3	Explosive Fees towards Drawing Approval and towards Final License Fees for 3 years as applicable.	Vendor to Confirm		
21.4	Local NOC from District Magistrate from the date of receipt of Drawings Approval.	Vendor to Confirm		
22.0	PRE-DISPATCH INSPECTION AT SUPPLIERS WORKS	LOX BULLET ,VAPOURISOR UNIT & THEIR ACCESSORIES Shall be offered to BHEL Engineers at supplier's works for Pre-dispatch inspection.		
23.0	PROVE OUT AND ACCEPTANCE	After LOX bullet & their facilities have been installed & energised , demonstrations to be carried out for good working condition & ensuring operating parameters as per technical specification mentioned above.		
24.0	WARRANTY	warranty for products against defective materials and workmanship for a period of 12 months from the date of commissioning or 18 months from the date of despatch whichever is earlier		
25.0	DETAILED SCOPE OF SUPPLY	Detailed scope of supply like Item wise Description ,Qty, Make to be submitted along with offer.		
25.0	TIME SCHEDULE FOR DESIGN, SUPPLY, ERECTION, TESTING &	Four months from the date of issue of purchase order		

	COMMISSIONING			
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