



## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

An ISO 9001  
Company

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

<b>ENQUIRY</b>	Phone: +91 431 257 76 83 Fax : +91 431 252 07 19 Email : <a href="mailto:ramado@bheltry.co.in">ramado@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
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	<b>Enquiry Number:</b>	<b>Enquiry Date:</b>	<b>Due date for submission of quotation:</b>
	<b>2720800015</b>	<b>21.10.2008</b>	<b>24.11.2008</b>

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

Item	Description	Quantity	Delivery (Item required at BHEL on)
10	380 KVA Diesel Generator set as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	1 No.	31.05.2009

**Note: Offer should be  
Foreign Bidders: CFR Mumbai Port**


**Indigenous Vendors:**  
**FOR, BHEL, Stores**  
**Industrial Valves Plant**  
**433, Industrial Complex**  
**Goindwal – 143 423**  
**District: Tarn Taran (Punjab), India**


BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats along with technical specifications 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 "2720800015".

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 / MM / Capital Equipment

 <b>BHARAT HEAVY ELECTRICAL LIMITED</b> High Pressure Boiler Plant Tiruverumbur Tiruchirapalli-620 014 TamilNadu, India	<b>Enquiry No. :</b>	
	<b>Due Date :</b>	
	<b>Supplier Qtn. No.:</b>	
	<b>Date :</b>	
<b>380 KVA DIESEL GENERATOR SET</b>		
<b>PART-A: QUALIFYING CONDITION: The Supplier should meet the Qualifying Condition mentioned below for consideration of their offer.</b>		
<b>NAME &amp; ADDRESS OF THE SUPPLIER :</b>		
<b>TELEPHONE NOS.:</b>		
<b>FAX NOS.:</b>		
<b>E-MAIL ADDRESS :</b>		
<b>1.0</b>	<b>QUALIFYING CONDITIONS :</b>	
<b>1.1</b>	“Only those vendors, who have supplied and commissioned at least one 250 KVA capacity, 3 Phase Diesel Generator Set should quote. Presently the DG Set should be working satisfactorily for minimum one year after commissioning. However, if such DG Set has/had been supplied to BHEL, then the same should be presently working satisfactorily for minimum six months after its commissioning and acceptance in BHEL. The following information should be submitted by the vendor about the company where such DG Set has been supplied. This is required from all the vendors for qualification of their offer	Vendor to confirm and furnish details
1.2	Name of the customer / company where the DG Set is installed.	Vendor to furnish details
1.3	Complete postal address of the customer.	Vendor to furnish details
1.4	Year of commissioning.	Vendor to furnish details
1.5	KVA Rating of the DG Set	Vendor to furnish details
1.6	Name and designation of the contact person of the customer.	Vendor to furnish details
1.7	Phone, FAX no. and email address of the contact person of the customer.	Vendor to furnish details
1.8	Along with the offer, the supplier has to get One Performance certificate for satisfactory performance, from the customer to whom such DG Set was supplied. (Original Certificate or through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required by vendor.	Vendor to provide

 <b>BHARAT HEAVY ELECTRICAL LIMITED</b> <b>High Pressure Boiler Plant</b> <b>Tiruverumbur</b> <b>Tiruchirapalli-620 014</b> <b>TamilNadu, India</b>	<b>Enquiry No. :</b>	
	<b>Due Date :</b>	
	<b>Supplier Qtn. No.:</b>	
	<b>Date :</b>	
<b>PART-B: SPECIFICATION FOR 380KVA DIESEL GENERATOR SET</b>		
<b>NOTE:-</b>		
<b>1. Wherever applicable vendor to fill the columns such as the offer, the deviations &amp; the remarks of this format and to be submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.</b>		
<b>2. The offer and all documents enclosed along with the offer should be in English language only.</b>		
<b>NAME &amp; ADDRESS OF THE SUPPLIER :</b>		
<b>TELEPHONE NOS.:</b>		
<b>FAX NOS.:</b>		
<b>E-MAIL ADDRESS :</b>		

<b>SCOPE: SUPPLY, ERECTION &amp; COMMISSIONING OF 380KVA DIESEL GENERATOR SET</b>					
<b>SNO</b>	<b>DESCRIPTION FOR BHEL REQUIREMENT</b>	<b>BHEL SPEC</b>	<b>OFFER</b>	<b>DEVIATIONS</b>	<b>REMARKS</b>
<b>1.0</b>	<b>SCOPE:</b>				
1.1	Design, Manufacture, Testing, Supply, Installation & Commissioning of 1No. 380KVA, 0.8 PF, Diesel Generator Set comprising of the following:  a) Four Stroke Diesel Engine suitable for operation on High Speed Diesel fuel b) 415 Volt Alternator coupled to the Diesel Engine c) Fuel Tank d) Anti Vibration Mounts e) Common Base Frame for the DG Set f) Batteries with leads for starting g) Control Panel h) Standard Accessories	Vendor to Confirm			
1.2	AMF Panel for the above - 1 Set	Vendor to Confirm			
1.3	Accoustic Enclosure - 1No.	Vendor to Confirm			
1.4	Exhaust Stack of Suitable Height for the DG Set- 1 Set	Vendor to Confirm			
1.5	First Fill of Lube Oil	Vendor to Confirm			
1.6	Installation & Commissioning	Vendor to Confirm			
<b>2.0</b>	<b>SPECIFICATION:</b>				
<b>2.1</b>	<b>GENERATOR SET:</b>				
2.1.1	Standby Power Rating (KVA)	380			
2.1.2	Output Voltage & Frequency	415 V, 50 Hz			
2.1.3	Voltage Regulation (around $\pm 1\%$ )	Vendor to Specify			
2.1.4	Frequency Regulation	Vendor to Specify			
2.1.5	Power Factor (lagging)	0.80			
2.1.6	No. of Phases	3 Phase + Neutral			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.1.7	Model	Vendor to Specify			
<b>2.2</b>	<b>DIESEL ENGINE:</b>				
2.2.1	Standby Power Output (BHP)	Vendor to Specify			
2.2.2	Shaft Speed (around 1500 rpm)	Vendor to Specify			
2.2.3	Speed Stability	Vendor to Specify			
2.2.4	Direction of rotation	Vendor to Specify			
2.2.5	Make (Reputed make like Cummins, Perkins, Kirloskar, or equivalent)	Vendor to Specify			
2.2.6	Model	Vendor to Specify			
2.2.7	Aspiration	Turbo Charged-Aftercooled			
2.2.8	Electronic Governor (Class A1)	Vendor to Specify			
2.2.9	No. Of cylinders	Vendor to Specify			
2.2.10	Arrangement of Cylinder	Vendor to Specify			
2.2.11	Bore & Stroke (mm)	Vendor to Specify			
2.2.12	Displacement (liters)	Vendor to Specify			
2.2.13	Piston Speed (m/s)	Vendor to Specify			
2.2.14	Compression ratio	Vendor to Specify			
2.2.15	BMEP of the engine	Vendor to Specify			
2.2.16	Fuel	HSD			
2.2.17	Specific Gravity of Fuel	Vendor to Specify			
2.2.18	Fuel Consumption @ 75% load	Vendor to Specify			
2.2.19	Fuel Consumption @ 100% load	Vendor to Specify			
2.2.20	Combustion Air Intake @ 100% load	Vendor to Specify			
2.2.21	Air Filter	Vendor to Specify			
2.2.22	Lub Oil Capacity	Vendor to Specify			
2.2.23	Lub Oil Grade	Vendor to Specify			
2.2.24	Lub Oil Consumption at Full Load	Vendor to Specify			
2.2.25	Lub Oil Cooling System	Vendor to Specify			
2.2.26	Lub Oil Filter	Vendor to Specify			
2.2.27	Coolant	Vendor to Specify			
2.2.28	Coolant Capacity (Engine & Radiator) (liters)	Vendor to Specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.2.29	Exhaust Temperature (deg C)	Vendor to Specify			
2.2.30	Aftercooler- Type & Location	Vendor to Specify			
2.2.31	Starting	Electric & Battery Start			
2.2.32	Length (Engine Alone) (mm)	Vendor to Specify			
2.2.33	Width (Engine Alone) (mm)	Vendor to Specify			
2.2.34	Height (Engine Alone) (mm)	Vendor to Specify			
2.2.35	Weight (Engine, radiator and fan)	Vendor to Specify			
<b>2.3</b>	<b>ALTERNATOR:</b>				
2.3.1	Design Maximum Rating (KVA)	Vendor to Specify			
2.3.2	Max Continuous Rating (KVA)	Vendor to Specify			
2.3.3	Rated Full Load Current (Amps)	Vendor to Specify			
2.3.4	Type	Brushless			
2.3.5	Excitation	Seperately excited, self-regulated			
2.3.6	Field	Salient Pole revolving			
2.3.7	AVR (Details to be furnished by Vendor)	Vendor to Specify			
2.3.8	Voltage Regulation (%) - no load to full load	Vendor to Specify			
2.3.9	Insulation	Class H			
2.3.10	Stator Winding	Vendor to Specify			
2.3.11	Rotor should be dynamically balanced	Vendor to Confirm			
2.3.12	Bearing for Rotor	Double Bearing			
2.3.13	Rotor should be dynamically balanced	Vendor to Confirm			
2.3.14	Enclosure	IP 23			
2.3.15	Telephone Interference Factor	Vendor to Specify			
2.3.16	Total Harmonic Factor	Vendor to Specify			
2.3.17	Waveform Distortion (%) a) at no load b) at balanced load	Vendor to Specify			
2.3.18	Bearing Temperature Sensors (1 No per Bearing) <b>(To be quoted as an optional item)</b>	Vendor to Confirm			
2.3.19	Winding Temperature Sensors in each phase for monitoring the temperature (2 nos. of RTD's per phase). <b>(To be quoted as an optional item)</b>	Vendor to Confirm			
2.3.20	Make (Stamford / Leroy-Somer/equivalent)	Vendor to Specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.3.21	Model	Vendor to Specify			
2.3.22	Weight (Kgs)	Vendor to Specify			
<b>2.4</b>	<b>FUEL TANK:</b>				
2.4.1	Capacity (liters)	Vendor to Specify			
2.4.2	Location	Vendor to Specify			
2.4.3	Size (L mmx B mmx H mm)	Vendor to Specify			
2.4.4	Piping between fuel tank and engine are part of the scope of supply of vendor	Vendor to Confirm			
2.4.5	Fuel pipes, Overflow pipes , Drain valve for Fuel Tank, Vent connection for Fuel Tank, Fill connection for Fuel Tank, Inspection and Cleaning Hole for Fuel Tank, Level Gauge and Level Indicator for the fuel tank should be provided	Vendor to Specify			
<b>2.5</b>	<b>BATTERY &amp; BATTERY CHARGER:</b>				
2.5.1	Rating (AH)	Vendor to Specify			
2.5.2	Voltage	Vendor to Specify			
2.5.3	Type (preferably maintenance free)	Vendor to Specify			
2.5.4	Make (reputed makes like Exide, Amaron, AMCO etc)	Vendor to Specify			
2.5.5	Scope of Supply includes battery leads	Vendor to Confirm			
2.5.6	No. of Batteries	Vendor to Specify			
2.5.7	No. of Starts before re-charging	Vendor to Specify			
2.5.8	Battery charger with inbuilt auto/maual&float/Boost Facility .DCV Voltmeter&Ammeter	Vendor to Specify			
<b>2.6</b>	<b>AMF PANEL:</b>				
2.6.1	Cubicle type floor mounting control panel with the hinged doors-- PLC Based AMF Panel	Vendor to Confirm			
2.6.2	Suitably rated Electrically operated drawout type 4 pole ACB for Alternator	Vendor to Confirm			
2.6.3	Suitably rated Electrically operated drawout type 4 pole ACB for Mains	Vendor to Confirm			
2.6.4	Rating of Switchgear	Vendor to Specify			
2.6.5	Make of Switchgear (Shall be of reputed make like L&T, Siemens, ABB ,Areva,GE ).	Vendor to Specify			
2.6.6	Bus Bars of suitable rating for incoming & outgoing terminations	Vendor to Confirm			

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2.6.7	Overcurrent & Earth Fault relay to be provided	Vendor to Confirm			
2.6.8	Supply Failure Timer	Vendor to Confirm			
2.6.9	Restoration Timer	Vendor to Confirm			
2.6.10	Automatic Start / Stop of Engine	Vendor to Confirm			
2.6.11	Generator Voltage, Current & Frequency Monitoring & Display	Vendor to Confirm			
2.6.12	Battery Voltage Sensing & Monitoring	Vendor to Confirm			
2.6.13	Push Buttons for Manual Start / Stop	Vendor to Confirm			
2.6.14	Manual / Auto / Test -Mode Selector Switch	Vendor to Confirm			
2.6.15	Annunciation, Alarm & Trip Features	Vendor to Specify			
2.6.16	Indications for DG "ON", Load on DG	Vendor to Confirm			
2.6.17	Indications for MAINS "ON", Load on Mains	Vendor to Confirm			
2.6.18	Indications for Over Current & Earth Fault	Vendor to Confirm			
2.6.19	KVA , KW , & KWH Meter with instrument transformer.	Vendor to Confirm			
2.6.20	Meter for Power Factor	Vendor to Confirm			
2.6.21	Instrument fuses duly wired	Vendor to Confirm			
2.6.22	SMPS Based automatic Float cum Boost Battery Charger with DC Voltmeter & Ammeter, Selector Switch for Auto / Manual & Float /	Vendor to Confirm			
2.6.23	BHEL will provide required power cable from AMF Panel to Alternator. However all control cables & their wiring is in the Scope of the Vendor	Vendor to Confirm			
2.6.24	Complete technical details of the AMF Panel	Vendor to Furnish			
<b>2.7</b>	<b>PROTECTION (Alarm or Tripping):</b>				
2.7.1	Hot Water Temperature	Vendor to Specify			
2.7.2	Low Lube Oil Pressure	Vendor to Specify			
2.7.3	Over Speed	Vendor to Specify			
2.7.4	Low Coolant Oil Level	Vendor to Specify			
2.7.5	Air Filter Clog Indicator	Vendor to Specify			
2.7.6	Starting Failure	Vendor to Specify			
2.7.7	Generator Overload	Vendor to Specify			
2.7.8	Battery Voltage Low	Vendor to Specify			
2.7.9	Others	Vendor to Specify			
<b>2.8</b>	<b>ACCOUSTIC ENCLOSURE:</b>				
2.8.1	The maximum permissible sound pressure level shall not exceed 75 dB(A) at 1 metre from the enclosure surface.	Vendor to Confirm			



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2.8.2	Enclosure should be provided with an "Emergency-off" Push Button	Vendor to Confirm			
2.8.3	Enclosure shall be min 1.6mm(16 swg) sheet steel and painted	Vendor to Confirm			
2.8.4	View Glass shall be provided	Vendor to Confirm			
2.8.5	Acoustic enclosures parts shall be powder coated after 7 tank pre treatment process	Vendor to Specify			
2.8.6	Accoustic Insulation Material shall be min 25mmPUF/100Rock wool	Vendor to Specify			
2.8.7	Openings for pipe connections to be provided (Vendor to Furnish Details)	Vendor to Confirm			
2.8.8	Doors for easy access to the DG Set should be provided for easy inspection & maintenance	Vendor to Confirm			
2.8.9	Suitable accoustic insulation beading shall be provided for the doors	Vendor to Specify			
2.8.10	Suitable arrangement for fresh air inlet and hot air outlet shall be provided	Vendor to furnish details			
2.8.11	Sufficient fluorescent tube lamp lighting shall be provided inside the enclosure	Vendor to Confirm			
<b>2.9 EXHAUST SYSTEM WITH STACK:</b>					
2.9.1	Exhaust Connections	Flexible, Stainless Steel			
2.9.2	Vendor to provide exhaust piping , insulation & hangers and Support structure starting from engine to outside DG Room	Vendor to Confirm			
2.9.3	Exhaust Silencer should be provided	Vendor to Confirm			
2.9.4	Thermal insulation with aluminum sheet cladding for exhaust piping upto the stack is in the Scope of vendor	Vendor to Confirm			
2.9.5	Stack of required height as per pollution control norms should be provided and installed by the vendor for the DG Set .	Vendor to Confirm			
2.9.6	Stack Height (m)	Vendor to Specify			
2.9.7	The DG Set is proposed to be housed in a room of size 12 m (L) x 8 m (W) x 4.5 m(H)	Vendor to Note			
2.9.8	Emissions shall be within norms specified by Pollution Control Board and Environment Protection Rules.	Vendor to Confirm			
2.9.9	Emission Levels	Vendor to Specify			
<b>2.10 APPLICABLE CODES &amp; STANDARDS:</b>					
2.10.1	Rating Definition as per ISO 3046 / BS 5514				
2.10.2	IS 4722				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.10.3	BS 5000				
2.10.4	IEC 34/1				
2.10.5	ISO 8528				
2.10.6	IS- 4889, 10000, 10002				
2.10.7	Pollution Control Board directives with regard to exhaust stack height				
2.10.8	Fuel conforming to IS 1460				
2.10.9	Fuel consumption tolerance as per BS 5514				
2.10.10	Environmental Protection Rules				
2.10.11	Any other National /international standards /codes applicable to DG set				
<b>3.0</b>	<b>TOOLS FOR ERECTION, OPERATION &amp; MAINTENANCE :</b>				
3.1	Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc.for operation and maintenance of the DG Set should be supplied. List of such tools should be submitted with offer	Vendor to Furnish			
<b>4.0</b>	<b>SPARES:</b>				
4.1	Itemised breakup of mechanical & Electrical spares in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation should be offered by vendor. <b>(Unit Price of each item of spare should be offered)</b>	Vendor to provide List			
4.2	Vendor to confirm that complete list of spares for DG Set and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to Confirm			
<b>5.0</b>	<b>DOCUMENTATION :</b> <b>Three sets of following documents (Hard copies) in English language should be supplied along with the machine</b>				
5.1	Operating & Maintenance Manuals for the Diesel Engine	Vendor to Confirm			
5.2	Operating & Maintenance Manuals for the Alternator	Vendor to Confirm			
5.3	Operation & Maintenance Manual for the AMF Panel	Vendor to Confirm			
5.4	General arrangement plan of DG set.	Vendor to Confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
5.5	Piping schematic diagram	Vendor to Confirm			
5.6	Chimney drawing.	Vendor to Confirm			
5.7	Complete Master List of parts used in the DG Set shall be submitted by the vendor.	Vendor to Confirm			
5.8	One additional set of all the above documentation on CD ROM, possible to be offered.	Vendor to Confirm			
<b>6.0</b>	<b>FOUNDATION:</b>				
6.1	BHEL will carryout the civil work for foundations if any. Vendor shall provide details of the foundation for this purpose immediately after placement of LOI/P.O	Vendor to Confirm			
<b>7.0</b>	<b>ERECTION &amp; COMMISSIONING</b>				
7.1	Supplier shall be responsible for carrying out the erection, start up, testing and commissioning of the DG Set. Required technical personnel and labour required for the same shall be provided by the vendor. Tools, tackles, required for the same shall be arranged by the vendor. Crane help, if required, will be provided by BHEL free of cost. Service requirement like power, air & water shall be provided by BHEL at only one point.	Vendor to confirm			
7.2	Erection of the Stack and thermal insulation of the exhaust system is also under the responsibility of the vendor	Vendor to confirm			
7.3	Duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer. Charges for the same should be indicated in the price bid	Vendor to furnish			
7.4	Schedule of Erection and Commissioning shall be submitted after placement of order	Vendor to confirm			
<b>8.0</b>	<b>OPERATING CONDITIONS :</b>				

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8.1	The DG Set should work trouble free and efficiently under following operating conditions: Height above MSL: 78m Ambient Conditions: Temperature = 20 to 50 degree celsius Relative Humidity = 90% max.	Vendor to Confirm			
8.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year.	Vendor to confirm			
<b>9.0</b>	<b>MACHINE ACCEPTANCE: (Tests/Activities to be performed by Vendor)</b>	Should be accepted & confirmed by Vendor			
<b>9.1</b>	<b>Tests/Activities to be carried out at supplier's works in the presence of BHEL Engineers before dispatch :</b>				
9.1.1	Physical Inspection of all components of the DG Set	Vendor to Confirm			
9.1.2	Verification of Original test certificates for engine, alternator, acoustic enclosure, and all other bought out items.	Vendor to Confirm			
9.1.3	Run test of DG Set	Vendor to Confirm			
<b>9.2</b>	<b>Test/ Activities to be carried out at BHEL works while commissioning the DG Set :</b>				
9.2.1	8 hours Run Test	Vendor to Confirm			
9.2.2	Operation of protective devices.	Vendor to Confirm			
<b>10.0</b>	<b>PACKING:</b>				
10.1	Sea worthy / Road Worthy & rigid packing for the DG Set and accessories to avoid any damage/loss in transit.	Vendor to confirm			
<b>11.0</b>	<b>GUARANTEE :</b>				
11.1	24 months from the date of acceptance of the DG Set.	Vendor to confirm			