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 Fax : +91 431 252 07 19 Email : tvenkat@bheltry.co.in Web : www.bhel.com

TWO PART BID Tender to be submitted in two Parts	**Enquiry Number:** **2620900247**	**Enquiry Date:** **25.11.2009**	**Due date for submission of quotation:** **28.12.2009**

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	Quantity
10	**DG Set – 2000 KVA** as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	**3 Nos**.

Important points to be taken care during submission of offer

1. **Delivery required 10 months from the date of purchase order.**
2. **Grace period of 2 months beyond the above delivery period will be considered for which loading has to be done.**
3. **Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.**
4. **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 "2620900247".

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** Manager / Capital Equipment / MM

	BHARAT HEAVY ELECTRICAL LIMITED **High Pressure Boiler Plant** **Tiruverumbur** **Tiruchirapalli-620 014** **TamilNadu, India**			**Enquiry No. :**		
				Due Date :		
				Supplier Qtn. No.:		
				Date :		
	PART-A: QUALIFYING CONDITION: 3x2000KVA DIESEL GENERATOR SET SYSTEM					
	NOTE:-					
	Vendor should meet the Qualifying Condition mentioned below for consideration of their offer					
	NAME & ADDRESS OF THE SUPPLIER :					
	TELEPHONE NOS.:					
	FAX NOS.:					
	E-MAIL ADDRESS :					
1.0	**QUALIFYING CONDITIONS :**					
1.1	"Only those vendors, who have supplied and commissioned at least one 11000V, 2000 KVA capacity, 3 Phase Diesel Generator Set should quote. The DG Set should presently be working satisfactorily for more than one year after commissioning (as on the date of opening tender). However, if such DG Set has/had been supplied to BHEL, then the same should be presently working satisfactorily for more than six months after its commissioning and acceptance in BHEL. The following information should be submitted by the vendor about the companies where above DG Set has been supplied. This is required from all the vendors for qualification of their offer	Vendor to confirm and furnish details				
1.1.1	Name of the customer / company where the DG Set is installed.	Vendor to furnish details				
1.1.2	Complete postal address of the customer.	Vendor to furnish details				
1.1.3	Year of commissioning.	Vendor to furnish details				
1.1.4	KVA Rating, Voltage, Type(indoor/outdoor) of the DG Set	Vendor to furnish details				
1.1.5	Name and designation of the contact person of the customer.	Vendor to furnish details				
1.1.6	Phone, FAX no. and email address of the contact person of the customer.	Vendor to furnish details				
1.1.7	Performance certificate from the customers regarding satisfactory performance of DG Set supplied to them (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 furnish				
1.1.8	DELIVERY - The bidder shall quote the best possible delivery. However the delivery shall not exceed 10 months with an additional grace period of 2 months. The additional grace period will attract a penalty which is explained in the commercial terms of the enquiry. The delivery period shall be reckoned from date of purchase order to despatch from the vendor works.	Vendor to furnish				
N.V	V.R S.N K.SS	M.J		M.D		

	BHARAT HEAVY ELECTRICAL LIMITED **High Pressure Boiler Plant** **Tiruverumbur** **Tiruchirapalli-620 014** **TamilNadu, India**	**Enquiry No. :**	
		Due Date :	
		Supplier Qtn. No.:	
		Date :	

PART-B: SPECIFICATION CUM COMPLIANCE CERTIFICATE 3 X 2000KVA DIESEL GENERATOR SET SYSTEM

NOTE:-

1. The "Offer" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and 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.

2. The offer and all documents enclosed with offer should be in English language only.

NAME & ADDRESS OF THE SUPPLIER :	
TELEPHONE NOS.:	
FAX NOS.:	
E-MAIL ADDRESS :	

SCOPE: SUPPLY, ERECTION & COMMISSIONING OF 3 X 2000KVA DIESEL GENERATOR SET SYSTEM					
SNO	**DESCRIPTION FOR BHEL REQUIREMENT**	**BHEL SPEC**	**OFFER**	**DEVIATIONS**	**REMARKS**
1.0	**SCOPE:**				
1.1	Design, Manufacture, Testing, Supply, Installation & Commissioning of 3Nos. 2000KVA, 0.8 PF, Diesel Generator Set system comprising of the following: a) Four Stroke Diesel Engine suitable for operation on High Speed Diesel fuel b) 11KV Alternator coupled to the Diesel Engine c) Fuel Tank d) Mounting arrangement e) Common Base Frame for the DG Set f) Batteries with leads for starting g) Control Panel h) Standard Accessories i) Fuel storage system	Vendor to Confirm			
1.2	AMF, Relay, synchronising 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	Fuel unloading, storage and pumping system	Vendor to Confirm			
1.6	First Fill of Lube Oil	Vendor to Confirm			
1.7	Interconnecting power and control cables within the system	Vendor to Confirm			
1.8	Painting, Installation, Erection & Commissioning	Vendor to Confirm			
2.0	**SPECIFICATION:**				
2.1	**GENERATOR SET:**				
2.1.1	Standby Power Rating (KVA)	2000			
2.1.2	Output Voltage & Frequency	11KV, 50 Hz			
2.1.3	Voltage Regulation (around ± 1%)	Vendor to Specify			
2.1.4	Frequency Regulation	Vendor to Specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.1.5	Power Factor (lagging)	0.80			
2.1.6	No of Phases	3 Phase			
2.1.7	Model	Vendor to Specify			
2.1.8	Application	Outdoor. Weather covering shed if required will be provided.			
2.2	**DIESEL ENGINE:**				
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 Consumption at Full Load	Vendor to Specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.2.24	Lub Oil Cooling System	Vendor to Specify			
2.2.25	Lub Oil Filter	Vendor to Specify			
2.2.26	Coolant	Vendor to Specify			
2.2.27	Coolant Capacity (Engine & Radiator) (liters)	Vendor to Specify			
2.2.28	Exhaust Temperature (deg C)	Vendor to Specify			
2.2.29	Aftercooler- Type & Location	Vendor to Specify			
2.2.30	Mechanical overspeed trip device	Vendor to confirm			
2.2.31	Starting	Electric & Battery Start			
2.2.32	Complete air and exhaust gas system comprising intake filters, intake manifold, expansion bellows, exhaust piping, bends, fittings, silencer etc.	Vendor to confirm			
2.2.33	Length (Engine Alone) (mm)	Vendor to Specify			
2.2.34	Width (Engine Alone) (mm)	Vendor to Specify			
2.2.35	Height (Engine Alone) (mm)	Vendor to Specify			
2.2.36	Weight (Engine, radiator and fan)	Vendor to Specify			
2.3	**ALTERNATOR:**				
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	Voltage Regulation (%)- no load to full load	Vendor to Specify			
2.3.8	Insulation	Class H			
2.3.9	Stator Winding	Vendor to Specify			
2.3.10	Rotor should be dynamically balanced	Vendor to Confirm			
2.3.11	Bearing for Rotor	Double Bearing			
2.3.12	Rotor should be dynamically balanced	Vendor to Confirm			
2.3.13	Enclosure	IP 23			
2.3.14	Telephone Interferance Factor	Vendor to Specify			
2.3.15	Total Harmonic Factor	Vendor to Specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.3.16	Waveform Distortion (%) a) at no load b) at balanced load	Vendor to Specify			
2.3.17	Bearing Temperature Sensors (1 No per Bearing)	Vendor to Confirm			
2.3.18	Winding Temperature Sensors in each phase for monitoring the temperature (2 nos. of RTD's per phase).	Vendor to Confirm			
2.3.19	Make (Stamford / Leroy-Somer/equivalent)	Vendor to Specify			
2.3.20	Model	Vendor to Specify			
2.3.21	Weight (Kgs)	Vendor to Specify			
2.3.22	Automatic Voltage Regulator suitable for parallel operation of generators	Vendor to Specify			
2.3.23	Engine mounted instruments and control with provision for remote indication/ operation comprising set start/stop, speed raise/lower, alarm, anunciation, gauges, meters etc.	Vendor to furnish details			
2.4	**FUEL TANK:**				
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			
2.5	**BATTERY:**				
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			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
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			
2.6	**AMF, GENERATOR PROTECTION & SYNCHRONISING PANEL:**				
2.6.1	PLC Based AMF, Protection & Synchronising Panel	Vendor to Confirm			
2.6.2	Suitably rated Electrically operated drawout type 3 pole + Neutral isolation ACB with required C.T., P.T., Ammeter, Voltmeter, indication lamps for Alternator	Vendor to Confirm			
2.6.3	Suitably rated Electrically operated drawout type 3 pole + Neutral isolation ACB with required C.T., P.T., Ammeter, Voltmeter, indication lamps 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, Areva, ABB, Siemens etc acceptable to BHEL)	Vendor to Specify			
2.6.6	Bus Bars of suitable rating for incoming & outgoing terminations	Vendor to Confirm			
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	KW & KWH Meter	Vendor to Confirm			
2.6.20	Meter for Power Factor	Vendor to Confirm			
2.6.21	Instrument fuses duly wired	Vendor to Confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.6.22	SMPS Based automatic Float cum Boost Battery Charger with DC Voltmeter & Ammeter, Selector Switch for Auto / Manual & Float / Boost	Vendor to Confirm			
2.6.23	Neutral grounding resistor panel as required	Vendor to Confirm			
2.6.24	Synchronising logic panel comprising synchronising lamps, digital meters for generator/ Bus voltage/ frequency , synchroscope etc. as required.	Vendor to Confirm			
2.6.25	Power and control cables for interconnection within the system	Vendor to Confirm			
2.6.26	Complete technical details of the Panel	Vendor to Furnish			
2.6.27	The Panels, VCB etc. to be housed in indoor type control room. Room construction under the scope of BHEL. Vendor to give layout and indicate the approx. size of the room.	Vendor to Furnish			
2.7	**PROTECTION (Alarm or Tripping):**				
2.7.1	High 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			
2.8	**ACCOUSTIC ENCLOSURE:**				
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			
2.8.2	Enclosure should be provided with an "Emergency-off" Push Button	Vendor to Confirm			
2.8.3	Enclosure shall be of suitable gauge sheet steel and painted	Vendor to Confirm			
2.8.4	View Glass shall be provided	Vendor to Confirm			
2.8.5	Gauge of Steel Enclosure	Vendor to Specify			
2.8.6	Accoustic Material	Vendor to Specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
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			
2.9	**EXHAUST SYSTEM WITH STACK:**				
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 out side DG area	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 . Refer document annexure-A of document"Central pollution control board-(MoEF Government of India) requirement of 2000KVA DG Sets used for power plant" Annexure-1	Vendor to Confirm			
2.9.6	Stack Height (m)	Vendor to Specify			
2.9.7	The DG Sets are proposed to be provied with a weather proof roof on the top. Vendor to give a layout indicating the space required.	Vendor to specify			
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			
2.9.10	If the DG sets complete or as components are imported then the vendor shall take necessary clearence from Government of India for such DG sets/parts	Vendor to Confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
2.10	**FUEL STORAGE SYSTEM:**				
2.10.1	Fuel	HSD			
2.10.2	Storage Capacity	50 KL			
2.10.3	Mounting	Above floor level			
2.10.4	Fuel loading system complete unloading pump, valves, strainers, piping, electrical controls etc.	Vendor to confirm			
2.10.5	Fuel tank with level indicator, venting system, Flame arester as per IS 803	Vendor to confirm			
2.10.6	Fuel puming system for fillling the day tank comprising pumps, valves, filters, pipelines, return line from day tank, electric controls,SS braides hoses with required flanges	Vendor to confirm			
2.10.7	Complete P&I diagram and layout drawing to be furnished with the offer	Vendor to confirm			
2.10.8	Pump and motor details to be furnished with the offer	Vendor to furnish			
2.10.9	Necessary clearance from Statutory authorities to be obtained by the vendor	Vendor to confirm			
2.10.10	Necessary civil works in the scope of BHEL	Vendor to note			
2.11	**APPLICABLE CODES & STANDARDS:**				
2.11.1	Rating Definition as per ISO 3046 / BS 5514				
2.11.2	IS 4722				
2.11.3	BS 5000				
2.11.4	IEC 34/1				
2.11.5	ISO 8528				
2.11.6	IS- 4889, 10000, 10002				
2.11.7	Pollution Control Board directives -Refer attached document "Central pollution control board-(MoEF Government of India) requirement of 2000KVA DG Sets used for power plant" Annexure-1				
2.11.8	Fuel conforming to IS 1460				
2.11.9	Fuel consumption tolerance as per BS 5514				
2.11.10	Environmental Protection Rules				
3.0	**TOOLS FOR ERECTION, OPERATION & MAINTENANCE :**				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
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			
4.0	**SPARES:**				
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. **(Unit Price of each item of spare should be offered)**	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			
5.0	**DOCUMENTATION :** **Three sets of following documents (Hard copies) in English language should be supplied along with the machine**				
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			
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, wherever possible.	Vendor to Confirm			
6.0	**FOUNDATION:**				
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			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
7.0	**ERECTION & COMMISSIONING**				
7.1	Supplier shall be responsible for carrying out the painting, 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 a arranged for by the vendor. 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 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			
8.0	**OPERATING CONDITIONS :**				
8.1	The DG Set should work trouble free and efficiently under following operating conditions: Ambient Conditions: Temperature = 20 to 45 degree celsius Relative Humidity = 95% max. Height above MSL: 78.0 m	Vendor to Confirm			
8.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year.	Vendor to confirm			
9.0	**MACHINE ACCEPTANCE: (Tests/Activities to be performed by Vendor)**	Should be accepted & confirmed by Vendor			
9.1	**Tests/Activities to be carried out at supplier's works in the presence of BHEL Engineers before dispatch :**				
9.1.1	Physical Inspection of all components of the DG Set	Vendor to Confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	BHEL SPEC	OFFER	DEVIATIONS	REMARKS
9.1.2	Verification of Original test certificates in English for engine, alternator, acoustic enclosure, and all other bought out items.	Vendor to Confirm			
9.1.3	Run test of DG Set-Meaurement of emmissions	Vendor to Confirm			
9.2	**Test/ Activities to be carried out at BHEL works while commissioning the DG Set :**				
9.2.1	8 hours Run Test	Vendor to Confirm			
9.2.2	Operation of protective devices.	Vendor to Confirm			
9.3	**Training in O&M of the DG set to be given to BHEL personnel at Supplier,s works or at any other place in India**	Vendor to Confirm			
10.0	**PACKING:**				
10.1	Sea worthy / Road Worthy & rigid packing for the DG Set and accessories to avoid any damage/loss in transit as required.	Vendor to confirm			
11.0	**GUARANTEE :**				
11.1	12 months from the date of acceptance of the DG Set.	Vendor to confirm			

Central Pollution Control Board
(MoEF – Government of India) requirements for
2000 KVA Diesel Generator Sets used for power plant.

Requirements also include:

1. The supplier shall confirm to the requirements of Environmental Protection Act (including all amendments/ revisions / guidelines etc., by CPCB Guidelines) **not limited to** the extract of the Schedule I of the above act Sl No 96 given below in Annexure A).
2. Refer: Systems & Procedures for compliance with noise limits for Diesel Generator Sets (up to 1000 KVA) issued by Central Pollution Control Board (MoEF – Govt of India) – appended at the end of this document.
   - 2.1 Part I – Section 2.0
   - 2.2 Part II – Full
   - 2.3 Part III - Full
3. Sampling port details to be provided in the stack as given below (Annexure B).
4. Responsibility of the supplier include the demonstration (proving) of the compliance (as per the Pollution Control Board requirements & this specification) at his cost and risk.
5. Calibration of the measuring instruments for the measurements given in Annexure A is in the scope of the supplier.
6. The supplier shall confirm in writing for compliance to all requirements of CPCB.
7. Fuel storage & distribution requirements shall be as per Petroleum Act / Rule & explosives Act.,

"96. **EMISSION STANDARDS FOR DIESEL ENGINES (ENGINE RATINGMORE THAN 0.8 MW (800 KW) FOR POWER PLANT, GENERATOR SET APPLICATIONS AND OTHER REQUIREMENTS**

TABLE

Parameter		Area Category	Total engine rating of the plant (includes existing as well as new generator sets)	Gerator sets commissioning date		
				Before 1/7/2003	Between 1/7/2003 and 1/7/2005	On or after 1/7/2005
Nox (as NO2) (AT 15% O2), dry basis, in ppmv		A	Upto 75MW	1100	970	710
		B	Upto 150MW			
		A	More than 75MW	1100	710	360
		B	More than 150MW			
NMHC (as C) (at 15% O_2), mg/Nm^3		Both A and B		150	100	
PM (at 15% O_2), mg/Nm^3	Diesel Fuels - HSD & LDO	Both A and B		75	75	
	Furnace Oils - LSHS & FO	Both A and B		150	100	
CO (at 15% O2), mg/Nm3		Both A and B		150	150	
Sulphur content in fuel		A		<2%		
		B		<4%		
Fuel specification		For A only	Up to 5MW	Only Diesel Fuels (HSD, LDO) shall be used.		
Stack height (for generator sets commissioned after 1/7/2003)		Stack height shall be maximum of the following, in meter: 14 $Q^{0.3}$, Q = Total SO_2 emission from the plant in kg/hr - Minimum 6 m above the building where generator set is installed. (iii) 30 m.				

-

Note:

1. Acronyms used:
MW : Mega (10^6) Watt
FO : Furnace Oil
NO_x : Oxides of Nitrogen
HSD : High Speed Diesel
NO_2 : Nitrogen Dioxide
LDO : Light Diesel Oil
O_2 : Oxygen
LSHS : Low Sulphur Heavy Stock
NMHC : Non- Methane Hydrocarbon
kPa : Kilo Pascal
C : Carbon
mm : Milli (10^{-3}) metre
PM : Particulate Matter
kg/hr : Kilo (10^3) gram per hour
CO : Carbon Monoxide
mg/Nm^3 : Milli (10^{-3}) gram per
SO_2 : Sulphur Dioxide Normal metre cubic
ppmv : part per million (10^6) by volume

2. Area categories A and B are defined as follows:---Category A: Areas within the municipal limits of towns/cities having population more than 10 lakhs and also upto 5 km beyond the municipal limits of such towns/cities.

Category B: Areas not covered by category A.

3. The standards shall be regulated by the State Pollution Control Boards or Pollution Control Committees, as the case may be.
4. Individual units with engine ratings less than or equal to 800 KW are not covered by this notification.
5. Only following liquid fuels viz. High Speed Diesel, Light Diesel Oil, Low Sulphur Heavy Stock and Furnace Oil or liquid fuels with equivalent specifications shall be used in these power plants and generator sets.
6. For expansion project, stack height of new generator sets shall be as per total Sulphur Dioxide emission (including existing as well as additional load).
7. For multi engine plants, fuels shall be grouped in cluster to get better plume rise and dispersion. Provision for any future expansion should be made in planning stage itself.
8. Particulate Matter, Non-Methane Hydrocarbon and percent moisture (dry basis). Carbon Monoxide results -are to be normalized to 25^0C, 1.01 Kilo Pascal (760 mm of mercury) pressure and zero.
9. Measurement shall be performed at steady load conditions of more than 85% of the rated load.
10. Continuous monitoring of Oxides of Nitrogen shall be done by the plants whose total engine capacity is more than 50 Mega Waft. However, minimum once in six month monitoring for other parameters shall be adopted by the plants.

11. Following methods may be adopted for the measurement of emission parameters,-

Sl.No.	Emission Parameters	Measurement Methods
1.	Particulates	Gravimetric
2.	SO_2	Barium Perchlorate- Thorin indicator method
3.	NO_X	Chemiluminescence, Non Dispersive Infra Red, Non Dispersive Ultra-violet (for continuous measurement),Phenol disulphonic method
4.	CO	Non Dispersive Infra Red
5.	O_2	Paramagnetic, Electrochemical sensor
6.	NMHC	Gas Chromatograph - Flame lonisation Detector

Annexure B

Sampling port details.

1. Four ports at 90 degrees apart in a plane to be provided.
2. The plane at which the port holes provided shall have a straight (inner) path 5 D in the upstream side and 3 D at the downstream side. (where D is the outer diameter of the stack)
3. Each port with Inner Dia (ID) 100 mm to be provided so as to enable the probe to reach the center of the stack for flow measurements.
4. Each port will have a 100 mm stand pipe and a flange at one end and the other end welded to the outer body of the stack. The flanged end shall be provided with a dummy flange to close the port when the measurements are not taken.
5. A platform around the stack at a convenient level (to the port holes) with hand rails and foot guard to be provided around the platform. This platform will be used to place the measuring equipment and manually insert the probes for sample collection.
6. A permanent approach ladder for the plant form shall be provided.

(EFFECTIVE FROM 15.1.2008)

SYSTEM & PROCEDURE

FOR

COMPLIANCE WITH NOISE LIMITS

FOR

DIESEL GENERATOR SETS (UPTO 1000 KVA)

January 2008

CENTRAL POLLUTION CONTROL BOARD

(Ministry of Environment & Forests, Govt. of India)

SCOPE

This document lays down the applicability and requirements, certification system and test procedures, for compliance with noise limits for new diesel generator sets (up to 1000 KVA) vide notification no. G.S.R. 371 (E), dated 17th May, 2002, at serial no. 94 of schedule I of Environment (Protection) Rules, 1986, and its amendments vide G.S.R. 520(E), dated 1st July, 2003; G.S.R. 448(E), dated 12th July, 2004; G.S.R. 315(E), dated 16th May, 2005, G.S.R. 464(E), dated 7th August, 2006 and G.S.R. 566(E), dated 29th August, 2007 issued by the Ministry of Environment and Forests, Government of India.

The details are covered as under:

Part –I	:	Noise Limits, Applicability and Other Requirements as per GSR 371(E), dated 17th May, 2002 and its amendments
Part – II	:	Certification System & Procedure
Part –III	:	Test Equipment and Procedure

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The revised Part II and Part III of this "System & Procedure for compliance with noise limits for diesel generator sets (upto 1000KVA)" shall be effective from 15.1.2008

PART I

NOISE LIMITS, APPLICABILITY AND REQUIREMENTS

The entries at serial no. 94 of schedule I of Environment (Protection) Rules, 1986, through G.S.R. 371(E), dated 17th May, 2002, and its amendments vide G.S.R. 520(E), dated 1st July, 2003; G.S.R. 448(E), dated 12th July, 2004; GSR 315(E), dated 16th May, 2005, G.S.R. 464(E), dated 7th August, 2006 and GSR 566 (E) dated August 29, 2007, prescribes noise limit, applicability and other requirements for new diesel generator sets (upto 1000 KVA), manufactured on or after 1st January, 2005 and are reproduced here:

"Noise Limit for Generator Sets run with Diesel

1.0 Noise limit for diesel generator sets (upto 1000 KVA) manufactured on or after the 1st January, 2005

The maximum permissible sound pressure level for new diesel generator (DG) sets with rated capacity upto 1000 KVA, manufactured on or after the 1st January, 2005 shall be 75 dB(A) at 1 metre from the enclosure surface.

The diesel generator sets should be provided with integral acoustic enclosure at the manufacturing stage itself.

The implementation of noise limit for these diesel generator sets shall be regulated as given in paragraph 3 below.

2.0 Noise limit for DG sets not covered by paragraph 1

Noise limits for diesel generator sets not covered by paragraph 1, shall be as follows:

2.1 Noise from DG set shall be controlled by providing an acoustic enclosure or by treating the room acoustically, at the users end.

2.2 The acoustic enclosure or acoustic treatment of the room shall be designed for minimum 25 dB(A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side (if the actual ambient noise is on the higher side, it may not be possible to check the performance of the acoustic enclosure / acoustic treatment. Under such circumstances the performance may be checked for noise reduction upto actual ambient noise level, preferably, in the night time). The measurement for insertion loss may be done at different points at 0.5 m from the acoustic enclosure / room, and then averaged.

2.3 The DG set shall be provided with proper exhaust muffler with insertion loss of minimum 25 dB(A).

2.4 These limits shall be regulated by the State Pollution Control Boards and the State Pollution Control Committees.

2.5 Guidelines for the manufacturers / users of Diesel Generator sets shall be as under:

01 The manufacturer shall offer to the user a standard acoustic enclosure of 25 dB(A) insertion loss and also a suitable exhaust muffler with insertion loss of 25 dB(A).

02 The user shall make efforts to bring down the noise levels due to the DG sets, outside his premises, within the ambient noise requirements by proper siting and control measures.

03 Installation of a DG set must be strictly in compliance with the recommendations of the DG set manufacturer.

04 A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer which would help prevent noise levels of the DG set from deteriorating with use.

3.0 Limits of Noise for DG Sets (upto 1000 KVA) Manufactured on or after the 1st January, 2005

3.1 Applicability

01. These rules apply to DG sets upto 1000 KVA rated output, manufactured or imported in India, on or after 1st January, 2005.

02. These rules shall not apply to –

a) DG sets manufactured or imported for the purpose of exports outside India; and

b) DG sets intended for the purpose of sample and not for sale in India.

3.2 Requirement of Certification

Every manufacturer or importer (hereinafter referred to as "supplier") of DG set (hereinafter referred to as "product") to which these regulations apply must have valid certificates of Type Approval and also valid certificates of Conformity of Production for each year, for all the product models being manufactured or imported from 1st January, 2005 with the noise limit specified in paragraph 1.

3.3 Sale, import or use of DG sets not complying with the rules prohibited

No person shall sell, import or use of a product model, which is not having a valid Type Approval Certificate and Conformity of Production certificate.

3.4 Requirement of Conformance Labelling

i) The supplier of the 'product' must affix a conformance label on the product meeting the following requirements:

(a) The label shall be durable and legible,

(b) The label shall be affixed on a part necessary for normal operation of the 'product' and not normally requiring replacement during the 'product' life.

ii) The conformance label must contain the following information:

(a) Name & address of the supplier (if the address is described in the owner's manual, it may not be included in the label),

(b) Statement "this product conforms to the Environment (Protection) Rules, 1986",

(c) Noise limit viz. 75 dB(A) at 1 m

(d) Type Approval certificate number

(e) Date of manufacture of the product

3.5 Nodal Agency

i) The Central Pollution Control Board shall be the Nodal agency for implementation of these regulations.

iii) In case of any dispute or difficulty in implementation of these regulations, the matter shall be referred to the nodal Agency.

iv) The nodal Agency shall constitute a Committee to advise it on all matters; including the disputed matters, related to the implementation of these regulations.

3.6 Authorised agencies for certification

The following agencies are authorized to carry out such tests as they deem necessary for giving certificates for Type Approval and Conformity of Production testings of DG sets and to give such certificates:

i) Automotive Research Association of India, Pune

ii) National Physical Laboratory, New Delhi

iii) Naval Science & Technology Laboratory, Visakhapatanam

iv) Fluid Control Research Institute, Palghat

v) National Aerospace Laboratory, Bangalore

3.7 Compliance and Testing Procedure

The compliance and testing procedure shall be prepared and published by the Central Pollution Control Board, with the help of the certification agencies."

4.0 "**Exemption from the provisions of paragraph 1 and 3, for the products (diesel generator sets upto 30 KVA) purchased by the Ministry of Defence, Government of India.**

The products manufactured in or imported into India till 30th April, 2007 for the purpose of supplying to the Ministry of Defence, shall be exempted from the regulations given in paragraphs 1 to 3 above, subject to the following conditions, namely:-

i) The supplier shall manufacture or import the products only after getting purchase order from the Ministry of Defence and shall maintain the record of receipts, production/import, dispatch, etc., for inspection by the Central Pollution Control Board.

ii) The special dispensation for noise norms shall be only for the mobile Defence vehicles which, with the present design/configuration, cannot carry the gensets with acoustic enclosures.

iii) Director, Ministry of Defence shall ensure and maintain the serial number of all gensets for the Army and he shall also direct the manufacturers of these gensets to emboss on the engine and the main body of the gensets, the words "**For the use of Army only**'.

iv) The genset serial number shall be specially assigned by Ministry of Defence with the request for proposal and contract purchase order and this information shall be forwarded to the Central Pollution Control Board for inspection as and when required.

v) Registers shall be maintained at the manufacturers premises and in the Ministry of Defence to ensure that the number of gensets manufactured under special dispensation are not misused.

vi) The gensets procured under this dispensation shall be operated in the remote areas and not in the cities.

vii) This shall be a one time exemption during which the Army shall remodel its vehicles to contain the new gensets and also obtain the necessary Type Approval of the gensets".

5.0 Exemption from the provisions of paragraph 1 and 3 for sixteen Diesel Generator sets of 45 KVA purchased by the Ministry of Defence, Government of India

The 45 KVA DG sets manufactured in India for the purpose of their use in Mobile Decontamination System for use by the Ministry of Defence shall be exempted from the regulations given in paragraph 1 to 3 above subject to the following conditions, namely:

(i) The special dispensation for the noise norms shall be only for the DG sets to be used in Mobile Decontamination System (MDS) by Army which, with the present design / configuration cannot carry gensets with acoustic enclosures.

(ii) The Director, Ministry of Defence, shall ensure and maintain the serial numbers for sixteen gensets and he shall also direct the manufacturers of these generator sets to emboss on the engine and main body of the gensets, the words “For the use of Army only in Mobile Decontamination System (MDS)”

(iii) A register shall be maintained at the manufacturers premises and in the Ministry of Defence to ensure that only sixteen numbers of 45 KVA gensets are manufactured under special dispensation and are not misused elsewhere.

PART II

CERTIFICATION SYSTEM & PROCEDURE

1.0 **GOEM / GOEA:**

1.1 **GOEM (GENSET ORIGINAL EQUIPMENT MANUFACTURER):** Genset manufacturer who uses its own engines or adopts the design of the genset and the acoustic enclosure provided by the engine manufacturer with his permission and approved by a certification agency.

1.2 **GOEA (GENSET ORIGINAL EQUIPMENT ASSEMBLER):** Genset manufacturer who adopts his own design of the genset and the acoustic enclosure.

2.0 MODEL FAMILY

2.1 For the purpose of type approval and conformity of production certification, the product range of the supplier (genset manufacturer or importer) shall be divided into model families, consisting of parent model and its variant(s).

2.2 The parent model shall be the worst case with the expected highest noise level in the family. Any other variant will have changes in the design and specifications, which will not adversely affect the noise levels of the variant.

2.3 To classify the models in the same family, the models must be identical in all of the following aspects.

I. Genset – kVA rating (subject to 2.4.1, 2.4.2)

II. Engine
- Make
- Combustion cycles (2/4 stroke)
- Cooling mechanism (air / water cooled)
- Number of cylinders, bore, stroke, displacement, rated speed
- Method of aspiration (naturally aspirated / super charged / turbo charged with or without inter-cooler)
- Exhaust silencer (design / dimensions / expected insertion loss)

III. Acoustic Enclosure
- Outer dimensions
- Wall thickness
- Insulation material :
  - Ø Type (glass-wool / rock-wool / mineral-wool / foam etc)
  - Ø Thickness
    - Ø Density

IV. Ventilation fan
- Diameter
- Speed
- Power
- Flow capacity
- Make

V. Anti-vibration mounts
- Make , Model
- Static Deflection

2.4 The models shall be classified as variants in the same family if the following are satisfied:

2.4.1 De-rating of engine up to 30 % with parameters at clause 2.3 of this part remaining same.

2.4.2 De-rating of alternator up to 30 % with parameters at clause 2.3 of this part remaining same.

2.4.3 Change of alternator make shall not change the family classification. However, all alternator makes shall be indicated by the supplier while submitting the type approval application or any addition of make(s) shall be informed to the certification agency for its record, before marketing the product.

2.4.4 Increase in enclosure size with other parameters at clause 2.3 of this part remaining same. No other modification either in the interior or exterior construction of the enclosure shall be done though the overall dimensions of the enclosure is increased, since any change in other design parameters can adversely impact noise levels, for example, increase / change in the spacing / angle of hot air louvers, change in position of the hot air outlet from the radiator or change in location of the hot air outlet.

2.4.5 Change to better noise absorbing insulating material with other parameters at clause 2.3 of this part remaining same. The certification agency will ascertain the absorption coefficient based on the test report issued by any accredited laboratory in the country.

3.0 SELECTION OF CERTIFICATION AGENCY

3.1 For type approval of all product models, the supplier shall submit applications to only one certification agency out of those prescribed in the notification.

3.2 The same certification agency shall be responsible for carrying out the verification of conformity of production (COP) for that supplier.

3.3 For any reason if any supplier wants to change the certification agency, he shall apply to the nodal agency well in advance with justifiable reasons. The application for

change of certification agency will be entertained only under extra ordinary circumstances. In such case the nodal agency after consultation with the certification agencies concerned, may approve the change.

3.4 On receipt of information for change in certification agency, from the nodal agency, the previous certification agency shall authenticate the copies of all the relevant documents (type approvals as well as COP verification) and forward the same to the new certification agency. The new certification agency shall be responsible for carrying out the type approval testing and COP verification for the supplier, thereafter.

3.5 Until the nodal agency gives approval for change in the certification agency, the previous certification agency shall continue to carry out type approval and COP verification for the supplier.

4.0 APPLICATION FOR TYPE APPROVAL

4.1 For each product model, the supplier must submit an application for type approval to the certification agency, selected as above.

4.2 The supplier, approaching for the first time for type approval, shall submit a notarized affidavit, as per **Annexure I**, to the nodal agency. The certification agency shall process the type approval only after the written acceptance of the affidavit from the nodal agency.

4.3 The supplier, approaching for the first time for type approval or an existing supplier wanting to open a new plant before starting the commercial production shall submit the profile and details of the company and /or plant (as applicable) to the certification agency and the nodal agency as per format prescribed in **Annexure - II**. The certification agency shall ascertain the adequacy of the documents & the plant before issue of type approval.

4.4 The application shall be made in the proforma prescribed in **Annexure- III** and must be complete in all respects.

The supplier shall submit to the certification agency, the details of the parent model and its variants for considering them as a family, with justification

Test results, if any, of the noise level test done in accordance with the requirement of this document may also be submitted along with the application.

4.5 The application must be signed on each page by the authorised representative of the supplier.

5.0 TYPE APPROVAL

5.1 The certification agency shall decide the family, the parent model and its variants depending upon the information provided by the supplier.

5.2 Testing of the parent model, as defined in clause 2.0 of this part, shall, normally be sufficient for type approval of the family. The certification agency has the option to carry out the testing of more than one model in the family to satisfy itself in this regard.

5.3 The certification agency shall inform the applicant within a fortnight of receipt of the application, plan (schedule) of testing for type approval.

5.4 It is the responsibility of the supplier (manufacturer as well as the importer) to provide the site and other facilities to the certification agency for testing for type approval.

5.5 The testing shall be done as per the procedure and specifications given in Part III of this document.

5.6 The product sample shall be deemed to have passed the test if the noise level of the sample does not exceed the applicable noise limit as tested in part III of this document.

However, if the product sample fails to complete the test or meet the acceptance criteria, as above, the supplier shall have the option to repair, modify or replace the same. If the design modifications reflect changes in the specifications given in the application, a fresh application with revised specification(s) shall be submitted by the supplier.

If the supplier is unable to repair, modify or replace the sample within a period of 3 months from the date of communication sent by the certification agency, the application for certification shall be deemed as withdrawn and a fresh application shall have to be submitted.

5.7 At a later stage, if the supplier submits the application for type approval of a variant to the already type approved model, the certification agency shall ascertain if it can be classified as belonging to a family of model(s) already certified.

If the model does not belong to a family already certified, the certification agency shall proceed with the testing of the model for the type approval as a new family.

If the model belongs to a family already certified, the certification agency shall decide whether the specific testing of the model is required. In case the specific testing of the model is not required, the type approval certificate for the family may be extended to include this model as a variant.

6.0 CERTIFICATE OF TYPE APPROVAL

6.1 After verification / testing for type approval, the certification agency shall inform the supplier within two weeks from the date of testing, indicating acceptance or non-acceptance decision and reasons thereof. If it is accepted, the certification agency shall issue the certificate of type approval indicating the parent model and its variants, as per the format prescribed in **Annexure-IV** within a month along with the test report.

Copy of the certificate shall also be forwarded to the nodal agency.

6.2 The type approval certificate issued for a genset model to a genset manufacturer shall be valid for the same model manufactured at any other plant of the same manufacturer provided the new plant is verified by the certification agency for adequacy of the infrastructure and other facilities.

6.3 The type approval certificate of a genset model shall be valid for the calendar year in which the type approval testing has been carried out. Subsequently the validity of the type approval shall be extended by the conformity of production verification certificate.

6.4 In case the type approval certificate is issued for a new model after the conformity of production verification for a COP year, the validity of the Type Approval certificate shall be upto the end of the succeeding COP year.

6.5 In case of new supplier, if the type approval certificate is issued in the last quarter of a COP year, the validity of the type approval certificate shall be upto the end of the succeeding COP year.

6.6 An indigenous engine manufacturer can get its design for gensets and acoustic enclosure tested for compliance with the noise limits as per part III of this procedure and obtain compliance report from the certification agency. In such cases, the certification agency may issue type approval certificate to its GOEM for the model without carrying the test, provided the GOEM submits the compliance report along with written consent of the engine manufacturer for use of its design and specifications. However, it shall also be the responsibility of the engine manufacturer to ensure that its GOEM manufactures and sells gensets as per its approved design and specifications.

6.7 The certification agency shall ensure that the applicant has submitted the following documents before issue of the type approval certificate

i) Genset Manufacturing License from Directorate of Industries / Department of Industry for a plant (in case of genset manufacturer), IEC code from DGFT (in case of importer)
ii) VAT / Sales Tax Registration
iii) Excise Registration (in case of genset manufacturer)
iv) Type Approval certificate for the relevant engine model for compliance with the emission limits
v) Valid COP certificate of the engine manufacturer for the emission limits
vi) Valid COP certificate (for the relevant plant, in case of indigenous genset manufacturer) for the noise limits for gensets

7.0 MODIFICATIONS IN THE PRODUCT MODEL

7.1 Any modification in the specifications of a model, which has been declared by the supplier as per **Annexure-III**, shall be intimated by the supplier to the concerned certification agency.

7.2 The certification agency may consider that the product with the modifications still comply with the requirements and shall extend the type approval covering the modified specifications; if not, consider the case as a fresh type approval.

8.0 VERIFICATION OF CONFORMITY OF PRODUCTION (COP)

8.1 Each supplier shall subject its product range to the verification of COP, every year. For this, the COP year shall mean the calendar year viz. 1st January to 31st December.

8.2 The testing shall be done on samples randomly selected by the certification agency, from the production line / import units.

8.3 The indigenous manufacturer shall submit to the concerned certification agency a request for carrying out conformity of production verification, preferred time for COP verification, with information as per **Annexure – V**, during the COP year but not later than 30th September. Once the request and the requisite information is submitted, it is the joint responsibility of the certification agency and the manufacturer to complete the COP verification in time i.e. before 31 December.

8.4 The certification agency shall inform the indigenous manufacturer the schedule (month) for sampling / testing. Accordingly, the manufacturer shall inform the tentative production plan, for the month in which the certification agency wants to carry out the COP, to the certification agency.

COP verification shall be carried out for each plant of the indigenous manufacturer.

The representatives of the certification agency may make a surprise visit to the factory / site and check whether the gensets are manufactured according to the type approved one.

8.5 In case of imports, the importer should inform the details of the import of each consignment to the certification agency at least 15 days in advance of the arrival of the consignment at the port. The certification agency shall decide the lot and the samples to be tested.

8.6 The testing shall be done as per the procedure and specifications given in part III of this document.

8.7 It is the responsibility of the supplier (manufacturer as well as the importer) to provide the site and other facilities for testing for COP verification.

8.8 In case of failure of any major component during the testing, the certification agency may permit once to replace the component, which has failed and which do not affect the performance and the noise levels of the product. In case of failure of component affecting the performance and the noise levels of the product, random selection and testing should be done once again. If the randomly selected product or replaced component fails again, it shall be concluded that the sample has failed.

9.0 SAMPLE SIZE AND DECISION CRITERIA FOR VERIFICATION OF COP

9.1 The number of samples randomly selected for COP verification of a plant shall be one sample for every two families with valid type approval and which the manufacturer wants to keep in production, subject to a minimum of 2 samples and maximum of 10 samples. In case the genset production in the plant in last COP year was less than 500, maximum of 5 samples can be tested for COP verification.

9.2 The number of samples offered for selection should be at least twice the number of models to be tested and there should be a reasonable spread of models. If it is not possible for the manufacturer to offer required numbers, another visit may be required before the end of COP period.

9.3 In case of import, the certification agency shall decide the consignment to be verified for COP and also the samples in the consignment depending upon the information provided by the importer. The number of samples to be tested shall be 2 % (rounded off to the next higher integral number) of gensets in each family, imported in a lot.

9.4 The product sample shall be deemed to have passed the test if the noise level of the sample does not exceed the applicable noise limit as tested in part III of this document.

9.5 The plant / import units shall be deemed to meet the conformity of production verification if all the samples tested during the COP verification, pass, as mentioned in 9.4, above.

9.6 In case any of the samples tested does not pass, supplier shall select any one of the two sampling plans and inform the certification agency accordingly.

Sampling Plan I : The supplier shall specify the size 'n' of the samples subject to 'n' being minimum 2 and maximum 10, including the gensets originally taken.

The plant / import units shall be deemed to meet the conformity of production verification if the following condition is met.

$X_m + k. S < L$

Where

X_m = Arithmetic mean of the results of the tests conducted on 'n' no. of samples,

S = Standard deviation of the results of the tests conducted on 'n' no. of samples,

S^2 = Standard deviation of the results of the tests conducted on 'n' no. of samples,

$$= \sum_{i}^{n} (x_i - X_m)^2 / n$$

L = The noise limit.

k = A statistical factor dependent on 'n' and as in the Table given below.

n	2	3	4	5	6	7	8	9	10
k	0.973	0.613	0.489	0.421	0.376	0.342	0.317	0.296	0.279

Sampling Plan II: A cumulative plan as given in Table-I should be adopted. According to this Table, the number of failed samples for all models tested, should be less than or equal to the pass decision number appropriate to the cumulative number of samples tested.

Table – I

Cumulative samples	Pass No. (No of failures)	Fail No. (No. of failures)	Cumulative samples	Pass No. (No. of failures)	Fail No. (No. of failures)
1	(*)	(**)	16	6	11
2	(*)	(**)	17	7	12
3	(*)	(**)	18	7	12
4	0	(**)	19	8	13
5	0	(**)	20	8	13
6	1	6	21	9	14
7	1	7	22	10	14
8	2	7	23	10	15
9	2	8	24	11	15
10	3	8	25	11	16
11	3	8	26	12	16
12	4	9	27	12	17
13	5	10	28	13	17
14	5	10	29	14	17
15	6	11	30	16	17

(*) : no compliance decision at this stage
(**) : no non-compliance decision at this stage

The supplier is permitted to submit samples according to any one of the above plans within 30 days from the communication of failure of sample(s) in 1st test.

9.7 If, the above conditions / requirements given in 9.6 are not met, the plant / import units shall be considered to have failed the conformity of production verification. The failure report shall immediately be sent to the nodal agency by the certification agency.

9.8 In case the supplier could not organise for COP verification in a COP year, type approvals issued earlier shall not be valid and fresh Type Approvals have to be obtained.

10.0 CERTIFICATE FOR CONFORMITY OF PRODUCTION

10.1 After verification / testing for COP, the certification agency shall indicate compliance or non-compliance to the supplier within two weeks. In case of compliance, the certification agency shall issue a COP certificate for each plant as per format at **Annexure-VI** along with the test report within a month.

10.2 The COP certificate shall specify all the valid type approved models excluding those which the supplier wants to keep in production / continue to import.

10.3 Copy of the certificate shall also be forwarded to the nodal agency by the certification agency.

10.4 The certification agency shall ensure that the applicant has submitted following documents before issue of the COP certificate

i) Genset Manufacturing License from the Directorate of Industries / Department of Industry for the plant (in case of genset manufacturer), IEC code from DGFT (in case of genset importer)
ii) VAT / Sales Tax Registration
iii) Excise Registration (in case of genset manufacturer)
iv) Type Approval certificate for engine model for compliance with the emission limits
v) Valid COP certificate of the engine manufacturer for the emission limits
vi) Valid COP certificate (for the relevant plant, in case of indigenous genset manufacturer) for the noise limits for genset.

11.0 CONSEQUENCES OF NON-COMPLIANCE

11.1 If the COP verification report of the certification agency as per clause 9.7 indicates non-compliance, the supplier shall stop manufacturing in the plant / dispatch of imported gensets, immediately.

11.2 Further, the supplier must analyze the reasons for non-compliance, plan and take corrective actions in design, production line and units already produced or imported and submit a report to the nodal agency with a copy to the concerned certification agency, within four weeks of the receipt of the COP verification report.

11.3 If the supplier is unable to diagnose the reasons for non-compliance within stipulated time, this shall be clearly stated in the report.

11.4 Based on the diagnosis and corrective action plan submitted by the supplier, the nodal agency, in consultation with the standing committee may allow continuation of production in the plant / import if it is satisfied with the corrective actions planned / taken by the supplier with additional verification of COP in due course.

11.5 The supplier shall be given an opportunity to explain its views before taking a final decision.

11.6 It is the responsibility of the supplier to ensure at his cost that the modifications / modified components are carried out / retrofitted, within a period specified by the nodal agency, on all the products produced / dispatched in the period between the dates from which the COP became due and re-verification of COP or as decided by the nodal agency, in consultation with the standing committee.

PART –III

TEST EQUIPMENT AND PROCEDURE

1.0 GENERAL

1.1 The determination of sound power levels of a genset should be carried out according to ISO:8528 (part 10), meeting the requirement of grade 2 accuracy.

1.2 In case the material used in the enclosure is foam or any inflammable material, a test report on flammability as per IS:7888 "Methods of Test for Flexible Polyurethane Foam" should be produced by the supplier from an accredited laboratory.

1.3 The product (genset) to be tested for type approval or conformity of production shall be complete system and shall include the engine, the alternator, the air inlet system, exhaust system and the cooling system in the acoustic enclosure. The silencer should be provided without extension of exhaust piping. The exhaust pipe tail end shall be within the hypothetical parallelepiped surface at 1 m distance from the enclosure.

2.0 MEASUREMENT PROCEDURE

2.1 Run the product and adjust the load and engine speed ISO: 8528 (part 10)

2.2 Run the Generator set for half an hour at the rated load. Measure the difference between the air temperatures inside the enclosure at 50 mm from combustion air intake, away from the hot spot, and outside the enclosure. This difference should not be more than 7^{o} C. The ambient air temperature while this test is carried out shall not be less than $25\ ^{0}$ C.

2.3 Carry out the exhaust back-pressure measurement at rated load at the location as mentioned in IS: 10000 (as per **Annexure – VII**). The back-pressure measured shall not exceed the maximum pressure requirement specified by the engine manufacturer in its application for Type Approval for compliance with the emission limit for the engine.

2.4 If the specified temperature and backpressure requirements are not met, the test should be discontinued.

2.5 Carry out noise measurements as per ISO: 8528 (part 10)

2.6 Calculate A-weighted Sound Pressure Level from Sound Power Level, assuming free field over ground, at 1 m.

ANNEXURE - I

NOTARISED AFFIDAVIT ON NON-JUDICIAL STAMP PAPER OF Rs.10/-
[To be submitted to the Nodal Agency by a supplier approaching for the first time for TA]

I, ……., Chairman / President / Managing Director / Partner / CEO / Proprietor of M/s …… , having Registered Office at ……. engaged in manufacturing / import of diesel generator sets with manufacturing facilities at:

i) ……...
ii) ……...

am authorized to swear this affidavit for and on behalf of the above named Company. I do hereby solemnly affirm and declare as under:

1. That the deponent is well conversant with the facts and competent to swear this affidavit.
2. That the deponent declares that M/s ……. are manufacturer of diesel generator sets and are
   A) Generator set Original Equipment Manufacturer (GOEM) of
      (i) M/s ……..…….... (ii) M/s ……..
      Or
   B) Generator set Original Equipment Assembler (GOEA) using engines of
      (i) M/s ……..…….... (ii) M/s ……..
      Or
   C) Using their own *e*ngines.
3. That the deponent declares that M/s …….. are importer of diesel generator sets from
   (i) M/s ……. (ii) M/s ……..
4. That the deponent declares that M/s ……. will obtain Type Approval / Conformity of Production verification only from (Name of the Certification Agency)……. and will not approach any other Certification Agency for Type Approval / Conformity of Production verification for any of their Generator set models.
5. That the deponent declares that none of the Chairman, Managing Director, Partner, Director, Proprietor, Board Member in M/s ……. has been involved with a Company / Firm which has manufactured and sold non-compliant diesel generator sets on or after 1.1.2005.
6. That the deponent declares that M/s ……. will manufacture and sell only compliant Generator sets.

For M/s ……...Ltd.

(Name & signature with Co. stamp)
(DEPONENT)

VERIFICATION

Verified at ……..on this ……of ……,200.. that the contents of the above affidavit are true and correct to the best of my knowledge and belief and nothing has been concealed therein.

Place:……...
Date:……

For M/s ……..Ltd.
(Name & Signature with Co. stamp)
(DEPONENT)

ANNEXURE - II

FORMAT FOR SUBMISSION OF PROFILE AND DETAILS OF THE SUPPLIER

(A) COMPANY DETAILS

1. Name of the Company
2. Type of Company: Proprietor / Partnership / Private Ltd / Public Ltd
3. Name of the Proprietor / Partners / Directors (submit relevant documents)
4. Importer / manufacturer
5. Registered Office Address with phone number
6. Contact Address with phone number, fax number, email etc.
7. Name and designation of the authorised person for submission of documents and to deal with the certification agency
8. Plant addresses and contact details, in case of manufacturer
9. Name of the company from whom to import and its contact details , in case of importer

   Plant details, from where to import
10. Authenticated copies of following documents to be submitted

    i) Manufacturing License from Directorate of Industries / Department of Industry (in case of Manufacturer), IEC Code (in case of importer)

    ii) VAT / Sales Tax Registration

    iii) Excise Registration, in case of manufacturer

11 No. of employees

12. Engineers (if any)
13. Last year Turn-over
14. Any other business

(B) Details of Gensets (Proposed) manufactured / assembled / imported

	Model Names	Nos. produced /imported in current year	Nos. expected to be produced / imported in the next year
a)			
b)			
c)			
d)			

(C) Details of Infrastructure

1. Land : Owned / Rented

   Area (m^2):

2. Covered Area

3. Machinery

   a)

   b)

   c)

   d)

4. Testing facilities available including
   on assembled Genset (importer to provide the location and other details)

   a) Open Area for testing

   b) Load bank type and capacity

   c) Measuring Instruments

   d) Any other

(D) Quality Control

1. Quality Control Incharge

2. Quality Procedure:

ISO Certified since when
(enclose a copy of Operating Procedure)

3. Pre-delivery Inspection Procedure
On Gensets (including records
Maintained)

4. System of serial numbering and marking on
Genset and their sub-systems – e.g. all
Enclosures, etc.)

5. Interaction with the engine manufacturers on the
Quality – feedbacks / correction action etc. (If GOEM)

(SIGNATURE OF THE PROPRIETOR,
PARTNER OR DIRECTOR)

SEAL OF THE COMPANY

ANNEXURE- III

FORMAT FOR APPLICATION FOR TYPE APPROVAL

1 NAME AND ADDRESS OF THE MANUFACTURER

1.1 ADDRESS OF MANUFACTURING PLANT(S)

1.2 RELATION WITH ENGINE MANUFACTURER FOR THIS MODEL : GOEM / GOEA

2. NAME AND ADDRESS OF THE IMPORTER

2.1 NAME AND ADDRESS OF THE COMPANY AND ITS PLANT FROM WHERE THE GENSET TO BE IMPORTED

3. FOLLOWING DOCUMENTS SUBMITTED (IF NOT SUBMITTED EARLIER OR VALIDITY HAS EXPIRED)

i) GENSET MANUFACTURING LICENSE FROM THE DIRECTORATE OF INDUSTRIES / DEPARTMENT OF INDUSTRY FOR THE PLANT (IN CASE OF GENSET MANUFACTURER), IEC CODE FROM DGFT (IN CASE OF GENSET IMPORTER)
ii) VAT / SALES TAX REGISTRATION
iii) EXCISE REGISTRATION (IN CASE OF GENSET MANUFACTURER)
iv) TYPE APPROVAL CERTIFICATE FOR ENGINE MODEL FOR COMPLIANCE WITH THE EMISSION LIMITS
v) VALID COP CERTIFICATE OF THE ENGINE MANUFACTURER FOR THE EMISSION LIMITS
vi) VALID COP CERTIFICATE (FOR THE RELEVANT PLANT, IN CASE OF INDIGENOUS GENSET MANUFACTURER) FOR THE NOISE LIMITS FOR GENSET.

4. BRAND NAME

5. MODEL NAME

6. DIMENSIONS OF THE GENERATOR SET WITH ACOUSTIC ENCLOSURE

LENGTH……..mm
WIDTH ……mm
HEIGHT ……mm

7. (i) ENCLOSURE DETAILS : (ENCLOSE DIMENSIONSAL DRAWINGS);
INSULATION MATERIAL:
TYPE (GLASS-WOOL / ROCK-WOOL / MINERAL-WOOL / FOAM ETC)

THICKNESS
DENSITY
(IF FOAM, ATTACH A FLAMMABILITY TEST REPORT)

(ii) VENTILATION FAN:
DIAMETER
SPEED
POWER
FLOW CAPACITY
MAKE

(iii) ANTI-VIBRATION MOUNTS:
MAKE, MODEL & DRAWING
STATIC DEFLECTION

(IV) BASE-FRAME DETAILS:
DIMENSIONS, DRAWING
THICKNESS OF BASE-FRAME SHEET

8. ENGINE
(SUBMIT AUTHENTICATED COPY OF THE APPLICATION SUBMITTED TO THE CERTIFICATION AGENCY FOR TYPE APPROVAL CERTIFICATION FOR EMISSION LIMITS)

8.1 EXHAUST SYSTEM
(DESCRIPTION AND DIAGRAMS)

DESCRIPTION OF EXHAUST EQUIPMENT IF THE TEST IS MADE WITH THE COMPLETE EQUIPMENT PROVIDED BY THE ENGINE OR GENERATOR SET MANUFACTURER:

SPECIFY THE BACK PRESSURE (kPa) AT RATED POWER AS PER IS:…….
(SPECIFY THE TOLERANCE AND RANGE)

9. ALTERNATOR

i) SINGLE / DOUBLE BEARING
ii) MAKE
iii) MODEL
iv) TYPE : SINGLE PHASE/ THREE PHASE
ALTERNATING CURRENT /DIRECT CURRENT
v) RATED SPEED
vi) RATED VOLTAGE
vii) RATED CURRENT
viii) RATED CONTINUOUS POWER AS PER IS 8528 (PART 1) IN KW
ix) FREQUENCY (Hz)

10. PRODUCTION / IMPORT PLAN (SCHEDULE) AND ESTIMATED NO.
(MONTH-WISE)

11. ATTACH TRADE LEAFLETS AND MANUALS

12. IF THERE ARE VARIANTS TO THE MODEL, PROVIDE DETAILED COMPARISON BETWEEN THE PARENT MODEL AND VARIANTS ALONG WITH JUSTIFICATIONS FOR CONSIDERING THE VARIANTS AS A FAMILY OF THE CONCERNED MODEL. PLEASE ALSO INDICATE THE WORST CASE AND ITS JUSTIFICATION.

Verification:

Verified that the information's given above are correct to the best of my knowledge and belief.

Authorised Signatory

Company Seal

(The application shall be signed on each page)

****

ANNEXURE- IV

FORMAT FOR CERTIFICATE OF TYPE APPROVAL

Type Approval Certificate No. Date of issue:

Based on the verification of the documents and tests conducted on the genset model ____ manufactured / imported and submitted by M/s _____, it is certified that the following generator set model(s) comply with the provisions Govt. of India notification no. G.S.R. 371(E), dated 17th May, 2002 and its amendments till date, at serial no. 94 (paragraph 1 & 3) schedule I of the Environment (Protection) Rules, 1986 (Noise limit for diesel generator sets (upto 1000 KVA)).

Name of the supplier					
Importer / Manufacturer					
Contact Address:					
Factory Locations (Name & Address of Company from where to import)	1				
	2				
	3				
Generator set Models		PARENT	VARIANT 1	VARIANT 2	VARIANT 3
KVA Ratings					
Engine Make & Model					
Engine Ratings, KW					
Cooling Mechanism					
No. of Cylinders					
Rated speed, RPM					
Method of Aspiration					
Acoustic Enclosure Details	Outer Dimensions, mm				
	Sheet Thickness, mm				
	Wall Thickness, mm				
	Insulation Material Type,				
	Insulation Thickness, mm				
	Density of Insulation, Kg/m^3				
Silencer Details	External Dia :				
	Length:				
	MAX. Back Pr.				
Ventilation Fan Details	Diameter, mm				
	Speed, RPM				
	Kw				
	Make				
Noise Level (dBA)		_____ (Specified limit is 75 dB(A) at 1 m			

This Certificate is valid upto……. After this date the validity of this Certificate shall be extended by the Certificate of Conformity of Production verification

Signature
Head, Agency
(or its authorised representative)

Signature
Head, Laboratory

ANNEXURE – V

FORMAT FOR SUBMISSION OF DETAILS FOR COP VERIFICATION

<table>
<tr><td colspan="4">Production Data for COP year _____</td></tr>
<tr><td colspan="3">Name of supplier: ---------
Plant: ----------</td><td rowspan="8">Person responsible for COP: -------
Telephone No.:---------
Mobile No.:----------
Week in which COP can be conducted:--</td></tr>
<tr><td rowspan="2">Sr. No.</td><td rowspan="2">Genset Model</td><td colspan="2">No. of Gensets</td></tr>
<tr><td>Production till date</td><td>Estimate for Remaining period</td></tr>
<tr><td>1</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td><td></td></tr>
<tr><td>6</td><td></td><td></td><td></td></tr>
</table>

AUTHORISED SIGNATORY

SEAL OF THE COMPANY

ANNEXURE- VI

FORMAT FOR CERTIFICATE OF CONFORMITY OF PRODUCTION FOR THE YEAR……

COP Certificate No. Date of issue:

Based on the verification of the documents and tests conducted on the genset models manufactured / imported by M/s _____, it is certified that the following plants producing / import of generator set families and models mentioned below, comply with the provisions of Govt. of India notification G.S.R. 371(E), dated 17th May, 2002 and its amendments till date at serial no. 94 (paragraph 1 & 3) of schedule I of the Environment (Protection) Rules, 1986. (Noise limit for diesel generator sets (upto 1000 KVA)).

Name of the supplier			
Importer / Manufacturer			
Contact Address:			
Plant Addresses in which COP successful (in case of manufacturer):			
Sl.No	Parent Model	Variants	Type Approval Certificate No., & Date of issue
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

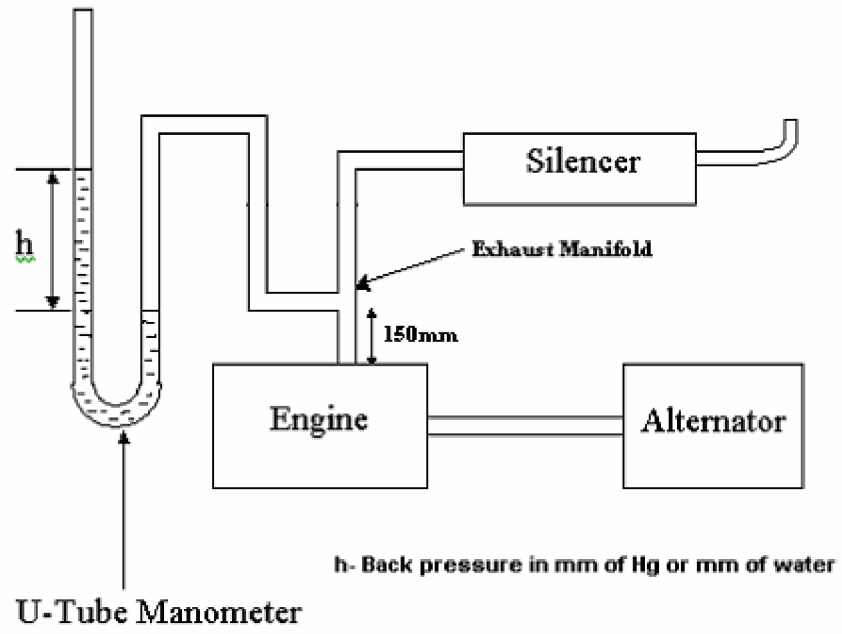
This Certificate is valid upto December 31,……. The validity of the aforementioned type approval certificates is extended upto December 31…….

Signature
Head, Agency
(or its authorised representative)

Signature,
Head, Laboratory.

ANNEXURE - VII

DIAGRAM FOR EXHAUST BACK PRESSURE MEASUREMENT



Back Pressure should be measured at 100 % loading condition

Fig: Measurement of Engine Exhaust Back Pressure