

TENDER

FOR

**SITC of silent type D.G. Set (250 KVA) with Kirloskar/ Cumines/
Crompton/ Mahindra & Mahindra/MTU/ Caterpillar Engine etc. and
sound insulated canopy for NRL & Auditorium building**

at

IARI Pusa, New Delhi

OWNER

**INDIAN AGRICULTURAL RESEARCH INSTITUTE
New Delhi**

PROJECT MANAGEMENT CONSULTANT

**NATIONAL PROJECTS CONSTRUCTION CORPORATION LTD.
(A GOVT. OF INDIA ENTERPRISE)**

C.O : PLOT NO. 67-68, SECTOR -25, FARIDABAD, HARYANA

SECTOR OFFICE : DZO, SEC-44, PLOT NO. 44, GURGAON

UNIT OFFICE: NEW PUSA UNIT, OLD POLICE STATION, IARI PUSA, NEW DELHI

Name of Contractor _____

Date of application & receipt no. _____

Tender issued on _____

Date of receipt of tender _____

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NPCC Limited
New Pusa Unit,
Old Police Station,
IARI, Pusa, New Delhi

**NATIONAL PROJECTS CONSTRUCTION CORPORATION LTD
(A GOVT. OF INDIA ENTERPRISE)
NEW PUSA UNIT, TYPE-III QUARTER, OLD POLICE STATION, IARI, PUSA ,NEW DELHI-12**

Ref. no. 407201/NIT/257

Dated: 6.7.2012

NOTICE INVITING TENDER

M/s. National Project Construction Corporation Limited (A Govt. of India Enterprise) on behalf of IARI Pusa, New Delhi invites sealed tenders from **OEM/Authorised Distributor/ Dealers/ Experience holder** of DG set and having in house manufacturing unit of Canopy works in 3 (three) envelop system:

Name of Work : **SITC of silent type D.G. Set (250 KVA) with Kirloskar/ Cumines/ Crompton/ Mahindra & Mahindra/MTU/ Caterpillar Engine etc. and sound insulated canopy for**
a) NRL building
b) Auditorium building at IARI Pusa, New Delhi.

Estimated cost : Rs. 39.00 lacs

Earnest Money Deposit : Rs. **97585** /- In the form of DD in Favour of NPCC Ltd. Payable at New Delhi

Time Period : 2 months

Cost of Tender Document : Rs. 5000/- (Non-refundable in cash/DD in favour of NPCC Ltd. New Delhi.

Last date for submission of tender document : 24.7.2012 upto 3.00pm

Date of Opening of Technical Bid : 24.7.2012 3.30 pm

- Separate envelope(s) should be superscribed as “EMD”, “Technical Bid” and “Price Bid”.
- Tender document may be obtained from the office of the undersigned between 11.00 AM to 4.00 PM from 9.7.2012 to 23.7.12. The tender document is available at NPCC Website www.npcc.gov.in for viewing only. Tenderer is required to get the tender document issued from the office of the undersigned before submitting document. The document which are issued from the office will only be entertained.
- Tender without requisite EMD shall be rejected out rightly.
- The date of opening of Price Bid will be intimated to the qualified agencies separately if not opened on the same day.
- Please upload the whole documents to Central Government Portal (CPMP)

**Project Manager
N.P.C.C. Limited
New Pusa Unit
Old Police Station
IARI Pusa, New Delhi**

**NATIONAL PROJECTS CONSTRUCTION CORPORATION LTD
(A GOVT. OF INDIA ENTERPRISE)
NEW PUSA UNIT, OLD POLICE STATION, IARI, PUSA, NEW DELHI-12**

Ref. No. 407201/NIT/257

Date: 6.7.2012

TENDER NOTICE

Sealed offers are invited by 23.7.2012 upto 3.00 PM for and on behalf of IARI for **SITC of silent type D.G. Set (250 KVA) with Kirloskar/ Cumines/ Crompton/ Mahindra & Mahindra/MTU/ Caterpillar Engine etc. and sound insulated canopy from OEM/ Authorized Distributor/ Dealers/ Experience holder of DG set and having in house manufacturing unit of Canopy need only apply for :**

- a) NRL building at IARI Pusa, New Delhi.(1no.)**
- b) Auditorium building at IARI pusa, New Delhi.(1no.)**

Tender document can be purchased from office of undersigned at New Pusa Unit, Old Police Station, IARI, Pusa , New Delhi.

Corrigendum/Addendum if any to this NIT would be loaded in our website & Central Government Portal (CPPP).

For details log on to our website www.npcc.gov.in

PROJECT MANAGER
Ph. No. 011-25841029

INFORMATION AND INSTRUCTIONS FOR TENDERERS :

1. The details of work to be carried out and its scope is given in the “Notice Inviting Tender” which also indicate a brief description of the project where work is to be executed. The tenderers are advised to study the same carefully before tendering and they shall be deemed to have fully acquainted themselves with the same.
2. The tenderers, in their own interest, are also advised to inspect and examine the site and its surroundings and satisfy themselves, before submitting their tenders, in respect of the site conditions including, but not restricting to, the following which may influence or effect the work or cost thereof under the contract.
 - a) Site conditions including access to the site, existing and required roads and other means of transport/communication for use by him in connection with the work.
 - b) All other information pertaining to and needed for the work including information as to the risks, contingencies and other circumstances which may influence or effect the work or the cost hereof under this contract.
 - c) The tenderers should note and bear in mind that the NPCC Ltd. shall bear no responsibility for the lack of acquaintance of the site and other conditions or any information relating thereto, on their part. The consequences of the lack of any knowledge, as aforesaid, on the part of the tenderer shall be at their risk and cost and no charges or claims whatsoever consequent upon the lack of any information, knowledge of understanding shall be entertained or payable by the NPCC Ltd.
3. The offer should be valid for **90(Ninety)** days from the date of opening of the tender.
4. The tender should be submitted in the prescribed form and the same should be signed properly as laid down hereunder :-
 - a) If the tender is submitted by an individual, it shall be signed by the proprietor above his full name and full name of his firm with its current business address.
 - b) If the tender is submitted by a firm in partnership, it shall be signed by all the partners of the firm above their full name and current business addresses, or by a partner holding the power of attorney of the firm by signing the tender in which case a certified copy of the power of attorney shall accompany the tender. A certified copy of the partnership deed and current business address of all the partners of the firm shall accompany the tenders.
 - c) If the tender is submitted by a limited company or a limited Corporation, it shall be signed by a duly authorized person holding the power of attorney for signing the tender in which case a certified copy of the power of attorney shall accompany the tender. Such limited company or corporation may be required to furnish satisfactory evidence of its existence before the existence before signature.
 - d) All witnesses and sureties shall be persons of status and their full names, occupation and addresses shall be stated below their signatures. All signatures affixed on each page in the tender will be dated.
 - e) The tender for the works shall not be witnessed by a tenderer or tenderers who himself/themselves has/have tendered or who may and has/have tendered for the same works. Failure to observe this condition shall render the tender of the tenderer tendering as well as of the witnessing the tender liable to rejection.

5. a) If during the tender validity period, the tenderer withdraws his tender the earnest money deposit shall be forfeited.

(b) The earnest money deposit will be returned to the unsuccessful tenderers after expiry of validity period or on finalization of tender whichever is earlier.
6. The rates shall be written both in words and in figures. Tenderer shall also show the total of each item, the total of each schedule and the grand total of the whole contract, corrections, if any, shall be made by crossing out, initialing, dating and rewriting. In case of conflict between the figures and words in the rates, the later shall prevail.
7. The corporation shall have the right of rejecting all or any of the tenders and split the work between two or more parties or may reduce the scope of work and also will not be bound to accept the lowest or any other tender and the Corporation's decision in this regard shall be final and binding on all tenderers.
8. Tenders will be opened in the presence of tenderers who may be present at the time of opening of tender. Corporation's Officers will on opening of tender of the absentee tenderer, prepares a statement of the attested and unattested corrections in the tender over their signatures. Such a list shall then be binding on the absentee tenderer.
9. The tenderers shall not be entitled during the period of validity of their offers, to revoke or withdraw their tenders or vary any terms in regard thereof without the consent of the NPCC Ltd. in writing. tenderer shall get his earnest money paid alongwith the tender forfeited for any violation of this clause.
10. If the tenderer fails to commence the work given in the scope of work within 02 days from the date of issue of written order to commence the work, the NPCC Ltd. shall have a right to forfeit the earnest money deposited by the tenderer absolutely without prejudice to other rights and remedies available with NPCC Ltd.
11. The "Notice Inviting Tender" and this "Information and Instructions for Tenderer" shall form part of the Tender Documents.
12. Any addendum/corrigendum issued before the date of opening of tender will form part of tender documents.
13. Intending tenderers should visit the site, satisfy themselves regarding the site conditions, location of site, access roads to the site and collect all relevant information required before tendering for the work, tenderer shall be deemed to have full knowledge of the site, specifications and no excuse as regard to want of information or clarification shall be considered after the tender has been received.

Dated : _____

Signature of the Contractor

Witness : _____

- 1.
- 2.

DECLARATION

To,
Project Manager,
NPCC Limited
New Pusa Unit
Old Police Station, IARI, Pusa
New Delhi - 110012

I/We have read and examined the following tender documents relating to the work of **SITC of D.G. Set silent type (250 KVA) with Kirloskar/ Cumines/ Crompton/ Mahindra & Mahindra/MTU/ Caterpillar Engine and sound insulated canopy for NRL & Auditorium Building at IARI,Pusa, New Delhi.**

1. Notice inviting tender
2. Information & instructions for tenderers
3. Declaration form & warranty form
4. General conditions of contract
5. Special conditions of contract
6. Bill of Quantities

I/We hereby, tender for the works referred to the documents mentioned above upon the terms and conditions contained or referred to in the aforesaid documents and in accordance with the details given therein and at the rates contained in Bill of Quantities within the period(s) of completion as given in Notice Inviting Tenders and subject to such terms and conditions as stipulated.

I/We agree to keep this tender open for acceptance for 90 days from the date of opening thereof and also agree not to make any modifications in its terms and conditions of our own accord.

A sum of **Rs. /-** is hereby forwarded in form of Demand draft as earnest money.

I/We agree if I/We fail to keep the validity of tender open, as aforesaid, or make any modification in the terms and conditions of my/our tender of our own accord and/or after the acceptance of our tender if I/We fail to commence the work within the stipulated time, as provided in the document referred to in paragraph 1 above, I/We shall become liable for forfeiture of my/our earnest money, as aforesaid, and the Corporation shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Should this tender be accepted, I/We agree to abide by and fulfill all the terms and conditions and provisions of the above mentioned tender documents.

I/We certify that the tender submitted by me/is strictly in accordance with the terms, conditions, specifications, etc. as contained in your tender documents, referred to in paragraph 1 above, and it is further certified that it does not contain any deviations to the aforesaid document.

Witness

Signature in the capacity of :

Date _____

Duly authorized to sign the tender
On behalf of the (in block letter)

WARRANTY FORM

M/s. _____ having its registered office at _____ (hereinafter referred to as the Contractor) having carefully studied all the documents, specifications, drawings etc. pertaining to the contract for work of **SITC of D.G. Set silent type (250 KVA) with Kirloskar/ Cumines/ Crompton/ Mahindra & Mahindra/MTU/ Caterpillar Engine and sound insulated canopy for NRL & Auditorium Building at IARI,Pusa, New Delhi.**

DO HEREBY WARRANTY THAT

1. The Contractor is familiar with all the requirements of the contract.
2. The Contractor has investigated the site and satisfied himself regarding the character of the work and local conditions that may affect the work or its performance.
3. The Contractor is satisfied that the work can be performed and completed as required in the contract.
4. The Contractor has had no collusion with other contract.
5. The Contractor has had no collusion with other contractors, with any of the men of the Engineer-in-charge or with any other person in Department execute the said works according to the terms and conditions of the contract.
6. The Contractor has not been influenced by any statement or promise of the Department of Engineer-in-charge but only the contract, documents.
7. The Contractor is financially solvent.
8. The Contractor is experienced and competent to perform the contract to the satisfaction of the Engineer-in-charge.
9. The statement submitted by the Contractor is true.
10. The Contractor is familiar with all general and special laws, acts, ordinance, rules and regulations of the municipalities, district, state and central govt. that may affect the work, its performance or personnel employed therein.

Dated _____

For & behalf of the Contractor

**GENERAL TERMS AND CONDITIONS FOR SUPPLY, INSTALLATION, TESTING AND
COMMISSIONING OF DG SET**

1. GENERAL

These conditions related to the supply, delivery, installation, testing and commissioning of DG Set for **NRL & Auditorium Building at IARI,Pusa, New Delhi.**

2. SCOPE

The scope under this contract includes design, supply and delivery, installation, testing and commissioning of the equipment listed in the specification accompanied with these conditions in accordance with the requirements laid down in the specifications and relevant Indian Standards.

3. PRICE

The price should be quoted at FOR destination and shall include all packing, crating, insurance, freight, handling and all other charges for delivering the equipment at the above site including all taxes and duties applicable at the time of supply installation, testing and commissioning, load trial and handing over to the owner.

4. a) DELIVERY SCHEDULE

The supplies shall be completed within 2 months from issuance of order

b) PLACE OF DELIVERY

The DG set shall be installed within **NRL & Auditorium Building at IARI,Pusa, New Delhi** at the designated location. The contractor should acquaint himself above the place of delivery before quoted offer.

5. INSPECTION

Inspection of equipment shall be carried out at manufacturer's work in the presence of the representative.

6. DEFECT LIABILITY PERIOD

The contractor shall guarantee the equipment against all defects of materials and workmanship for a period of 2years from the date of commissioning of the equipment as certified by the Engineer-in-charge. Any defects arising during the Guarantee period shall be rectified and made good by the contractor at his own expenses to the satisfaction of the EIC.

7. PAYMENT TERMS

- i) 80% of the total cost of DG set shall be released to the contractor/agency at the time of delivery at site.
- ii) Balance 15% of the total cost shall only be released after successful testing and commissioning of the DG set.
- iii) Balance 5% payment of the total works (security deposit inclusive of EMD), shall be made after 'defect liability period' of 24 (twenty four) months.

8. WARRANTY/GUARANTEE

Two Years

9. TRAINING OF OWNER'S PERSONNEL

The contractor shall train Owner's Personnel to become proficient in operating the equipment installed. Training shall be done before the expiry of the defects liability.

The period of training shall be adequate and mutually agreed upon by Owner and Contractor.

Owner's Personnel shall also be trained for routine maintenance work adjustment, testing minor repairs and replacement.

Nothing extra shall be paid to the contractor for training Owner's Personnel.

- 10.** Last date of receipt of offer will be 24.7.2012 up to 3.00 PM The offers will be opened on the same day at 3:30 PM at the office of the PROJECT MANAGER, N.P.C.C. Limited, New Pusa Unit, Old Police Station, IARI, Pusa, New Delhi.

- 11.** Tender documents can be purchased from the office of the PROJECT MANAGER, N.P.C.C. Limited, New Pusa Unit, Old Police Station, IARI, Pusa, New Delhi, from 9.7.2011 to 23.7.2012 on any working day on payment of 5000/- (Rs. five thousand only) in cash or DD in favour of NPCC Ltd.

12. COMPENSATION FOR DELAY (LIQUIDATED DAMAGES)

If the contractor fails to maintain the required progress in terms of clauses or to complete the work and clear the site on or before the contract or extended date period of completion, he shall, without prejudice to any other right or remedy of the Corporation on account of such breach, pay as agreed compensation amount calculated as stipulated below or such smaller amount as be fixed by the authority on the contract value of the work of every week that the progress incomplete. This will also apply to items or group of items for which separate period of completion has been specified. For this purpose the term 'Contract Value' shall be the value at contract rates of the work as ordered. The Liquidated Damages and penalty shall be @ 1% (one percent) of the cost of every incomplete work per week of delay subject to a maximum of 5% of the total cost. The amount of compensation/ liquidity damage may be adjusted or set-off against any sum payable to the contractor under this or any other contract with the Corporation.

13. Deduction of DVAT

NPCC Limited shall deduct TDS on DVAT as per prevailing rules or as applicable from time to time .

- 14.** Deduction of income tax: NPCC Limited shall deduct income tax at source from all the payments to be made to the contractor in accordance with the provisions of India Income Tax Laws as applicable to the contractor from time to time.

SPECIAL CONDITIONS OF CONTRACT

1. The bill of quantities are as per the detail enclosed with this tender documents.
2. **Deduction of income tax:** NPCC Limited shall deduct income tax at source from all the payments to be made to the contractor in accordance with the provisions of India Income Tax Laws as applicable to the contractor from time to time.
3. **Liability for EPF deduction:** The contractor shall be responsible for deduction contribution towards Employees Provident Fund from its employees and deposit the same along with its contribution to the concerned Regional Provident Fund commissioner under the Employees Provident Fund and Misc. Act, 1952 as amended from time to time.
4. **Price variation:** Quantities given in the tender document may increase or decrease. No extra payment shall be made for variation in quantities, whatever may be the percentage of increase or decrease in the quantities of any item. Rates shall remain firm even if certain items are required to be deleted.
5. **Mobilization advance:** No mobilization advance will be paid.
6. **Work Contract Tax:** Work contract tax will be recovered from each running account bill as applicable.
7. **Taxes, duties, levies etc.:** The contractor shall be responsible for the payment of all taxes, duties, levies, octroi, labour cess etc. all materials articles that may be used in this work. Any increase in the aforesaid taxes, duties and levies etc. that may arise during the currency of the contract shall not be paid to the contractor by Corporation.
8. **Security deposit:** The contractor shall permit the corporation at the time of making any payment to him for work done under the contract to deduct towards the security deposit at the rate of 10% (ten percent) of gross amount of each account and final payment. The earnest money deposited by the successful tenderer at the time of tender will be treated as part of security deposit.
9. **Refund of security deposit:** The security deposit so deducted shall only be refunded to the contractor after all the defect pointed out during operation and maintenance period gets rectified or after the payment of final bill whichever is later. In case the contractor fails to get the rectification done at his own cost, corporation shall have the right to get the same done at the risk and cost of the contractor.
10. All the materials to be incorporated in the works under this contract must be of reputed makes and /or as approved by the Engineer-in-charge.
11. The Engineer-in-charge reserves the right to increase or decrease the number of workmen to be deployed for the works to any extent.
12. The Engineer-in-charge reserve the right to deploy the workmen of the contractor anywhere in the Campus of the IARI as per the requirement.
13. Items for routine maintenance of electrical installation, which could not be specified in above details, will also be covered under this contract.
14. The contractor will provide consumable like cloth, etc. cleaning insulation, electric tubes, bulbs, CFL, Teflon tape, fittings, taps, tower bolt, hinges, M-seal, glass, cleaning material (like phenyl, surf, wipers, etc.), pesticides, fertilizer, etc. for which nothing extra shall be payable.

15. Contractor will be responsible to bring to immediately notice of the Engineer-in-Charge any abnormal functioning or faulty operation of any equipment and take timely steps to avoid breakdown/ disruption.
16. Contractor shall be responsible for any damage to the equipment, machinery or system on account of negligence/ fault of the contractor's authorized staff and the same will have to be made good at his risk and cost.
17. All dismantled materials resulting from replacement shall be returned to the Engineer-in-Charge or the representative appointed by him.
18. The operating staff will maintain daily log book and get it duly verified from the Engineer-in-Charge or his authorized agent.
19. The operating staff will be provided essential operation/ maintenance/ hand tools including multi meter, mugger, openers etc. by the contractor.
20. In case of absence from duty deductions shall be made @ 1.50 Times of salary of concerned workmen from the RA bill of the contractor.
21. The contractor has to follow all electricity rules as amended from time to time and contractor shall be responsible for any mishap due to negligence on his part.
22. In the event of break down or major maintenance works, any extra staff required thereof and for cable jointing and for handling heavy equipment shall be your responsibility and no extra charges shall be payable on this account.
23. Uniform: The contractor has to provide two pairs of uniforms of approved color to his employees while on duty within the premises they shall always be in uniform.
24. The contractor shall arrange and provide uniform and identity card to the workmen within one month from the date of works order issued, failing which an amount of Rs. 500/- per month shall be deducted from the subsequent monthly bills every month till such time the contractor provides the uniform to the workmen.
25. In case of negligence of part of the contractor for operation and maintenance of electrical, HT/ LT panels and its associated accessories a prorated recovery shall be made from due payments of the contractor for the period and its associated accessories remain non operational.
26. Service Tax : The rates are inclusive of Service tax applicable from time to time. The contractor shall have to furnish the deposit challans to the corporation in token that the service tax for the work has been paid by him.
27. Office Attendant & Inspection vehicle for site visit shall be provided by the Agency till the awarded work is completed for which no extra payment will be made to the agency otherwise, 1% (one percent) will be recovered from every running account bill.

TECHNICAL SPECIFICATION

ENGINE

General: The engine shall be stationary, compression ignition, totally enclosed, water cooled, 4 stroke direct injection, cold battery starting, turbo charged and low temperature with radiator cooled 1500 RPM in accordance to BS:5514 and IS:1002 complete with all accessories.

The DG engine shall be suitable for black start.

The DG engine shall be designed without any limitations on the number and frequency of starts in any given period.

- 1.2** Instrumentation of Engine: Electronic instrument panel shall be provided with following indications as minimum:

- i) RMP indication
- ii) Lube oil pressure indication
- iii) Lube oil temperature indication
- iv) Starting switch with key
- v) Hour meter
- vi) Emergency stop.

- 1.3 Alarms/Trips indications shall be provided as minimum:-**

- a) over speed
- b) High water temperature
- c) Low lube oil pressure

- 1.4** Exhaust Manifold: The exhaust manifold shall be multi branch, of insulated designed utilizing Ni-resist casting.

- 1.5** Governing system: The governor shall be electronic type
The governor shall be provided with a manually adjustable over speed trip mechanism to automatically shut-off the engine or the fuel supply if the set reaches 120% of rated speed. In addition to this, an engine mounted emergency push button/lever shall be provided. This shall trip the engine when depressed. This shall be suitably protected against accidental tripping.

- 1.6 Other Auxiliary Equipment/Services**

- a) Cooling : The engine shall be water cooled type. Adequate capacity radiator shall be provided.
- b) Silencer : Exhaust silencer shall be residential type to reduce the noise level

- 1.7 Day Service Fuel Tank**

Day service fuel tank shall be made of 3mm thick MS sheet of 990 liters capacity with all accessories such as oil level indicator, Inlet pipe connection, outlet pipe connection, trough to collect split oil, air vent pipe with air filter, manhole with cover, low level and full level float valve arrangements with all fittings, interconnections between tanks and engine. The tank shall be placed within enclosure.

2. ALTERNATOR

- 2.1** The alternator shall be brushless synchronous and suitable for 3 phase 415 volts, 4 wire, 50 Hz 0.8 p.f., 1500 RPM.
- 2.2** The alternator shall be suitable for coupling directly to the diesel engines. It shall be Drip proof, screen protected as per IP 21. It shall include one set of suitable rated foot

mounted anti condensation heaters. The alternator shall be double bearing type and self ventilating. The alternators shall be continuously rated and shall have class "F" insulation designed and built to withstand tropical conditions. It shall generally conform to BS:5000(part-99). The net rated output of the alternators at specified site conditions at 0.8 lagging powder factor shall be 500 KVA (400 KW). The alternator shall be suitable for sustaining a 10% overload for 1 hour in any 12 hours period without injury. The terminal arrangement for alternator shall be suitable for cable connections of adequate size to deliver the full load of the alternator.

- 2.3 The alternator shall also have a solid state type Automatic Voltage Regulator (AVR) suitable for single running with control limits of 1% from no load to full load under normal load changes. It shall be of static type and complete with cross current compensation. The regulator shall be provided with voltage adjusting potentiometer and shall be complete with all alarm contacts, internal wiring etc.
- 2.4 The engine and alternator shall be direct coupled and mounted on a common rigid fabricated steel base frame with suitable vibration isolation systems.
- 2.5 Exciter: Self excited, self regulated and providing alternator output regulation at plus or minus 2.5%.

3. SOUND ATTENUATING ACOUSTIC ENCLOSURE

- 3.1 Sound attenuation Acoustic Enclosure should have pleasant and aesthetical looks and should be able to bring down the noise by 75 decibels when measured at a distance of 1 meter away from the set.
- 3.2 The DG set should be supported on a base frame in an MS sheet enclosure with suitable ducting for air inlet and outlet. The door and enclosure should be given corrosion resistant treatment and painted to be weatherproof and long lasting. Resin bonded Glass/Mineral/Rock wool of high density (greater than 45 kg/cum.) with minimum thickness covered with perforated.
- 3.3 MS Sheet should be provided and covered with tissue paper. Enclosures should be provided with durable locking systems with doors duly gasket with neoprene rubber.
- 3.4 Exhaust gases should be taken out from the DG set by means of MS pipe and a noise suppressor.
- 3.5 Proper care should be taken for engine heat rejection in order to have safe working temperature inside the enclosure by provision of fans etc. as required. The design aspect should ensure free and uninterrupted flow of suction and exhaust air in order that the temperature rise of the enclosure with respect to the ambient is less than 7° C.

4. TESTS AT MANUFACTURER'S WORK

- 4.1 The following tests shall be performed at manufacture's prior to packing and dispatch to site.

4.2 On DG set;

- a) Load test at full load 50% load, 75% and 110% overload.
- b) Fuel consumption at full load, 50% load, 75% load and 25% load.
- c) Noise level measurement
- d) Other routine test as per IS/BS on alternator, exciter and AVR.

DATA SHEET

Diesel Generator

1.0 ENGINE

1.1 Rating

- i. Minimum Engine rating
- ii. Altitude (m)
- iii. Air humidity
- iv. Air temperature (*C)

Matching

Less than 1000m above mean sea level
 30% min. 95% max.
 Minimum 02
 Maximum 50
 Average 40

v. Duty

Continuous rating duty at specified ambient air
 Temperature of 45 ° C

vi. Standard

BS 5514 and ISO 3046

1.2 Overload capacity for one hour

10% over the continuous rating. In 12w hours
 of continuous running.

1.3 Governor

Electronic Type

1.4 Starting

- i. Method
- ii. No. of auto starts
- iii. Selectivity

Electric
 3 (three)
 Auto/Manual/Test

1.5 Cooling system

i) Radiator

Yes

1.6 Exhaust system

- i) Silencer
- ii) Flexible connection
- iii) Fuel level indicator (low)
- iv) Oil pressure gauge
- v) Thermo meters for lub. Oil
- vi) Hour counter

2 Nos. as required for Residential duty
 1 No. for each exhaust pipe near the engine
 Audible as well as visual alarm
 Yes
 Yes
 Yes

1.7 Sundry fittings

i. Vibration mounts

Yes, rubber in shear or any other type with
 6mm minimum static deflection on load.

2.0 ALTERNATOR

2.1 Rating at 45 Degree C (Ambient air temp.)

Continuous duty.
 Emergency duty

500 KVA (400 KW)
 10% over load for 1 hour in 12 hours

2.2 Minimum efficiency %

91.0

2.3 Excitation system

Brush less exciter with rotating diode assembly

2.4 Over speed

120

2.5 Terminal box

Suitable for cables as specified

3.0 FUEL OIL FACILITY

3.1 Day tank (14 SWG steel) 990 liters complete with over flow, drain, filter etc. within enclosure

4.0 Acoustic enclosure cooling Radiator cooled

ENCLOSURE DETAILS

Structure MS Press bent 3mm

PANELS

Type	Steel fabricated double wall insulated panels
Panel thickness	75mm thick
Outer sheet	2mm thick CRC sheet
Inner sheet	1.25mm thick CRC perforated sheet
Frame stiffener	2mm thick CRC sheet

INSULATION

Type Mineral wool/Rock/Glass wool
of reputed make as per IS:8183

Thickness 75mm thick (50mmx2 slabs)

Density 48 Kg/m²

FINISHING

Noise level (min) As per C PCB Norway

Notes Deviation if any, from the data sheet shall be specifically brought out by the tenderer.

SPECIFICATION OF AUTOMATIC MAINS FAILURE CONTROL CUBICLE

The panel will be made out of fabricated sheet suitable for indoor mounting installation, hinged front panel for easy accessibility and suitable rated bus bars, internal wiring, fuses with suitable provision for connection incoming/outgoing leads. It will include the following accessories:-

1. A) Alternator Contractor, three- pole suitable size with overload relay and 3 nos. HRC fuses with bases for protection.
B) Main Contractor.
2. 96 sq.mm flush mounted voltmeter with selector switch and fuses to read voltage on main/load/set.
3. 96 sq.mm flush mounted ammeter with selector switch.
4. One frequency meter 96 sq.mm flush mounted.
5. One set of main supply voltage monitor to identify low voltage complete failure and initiate necessary signal for operation of automatic control gear.
6. Push buttons, start stop and reset acknowledge.
7. Master switch for auto/manual/test/off.
8. One audio alarm.
9. One of lamps for indicating 'Load on Mains' and set fails to start, low oil pressure, high water temperature.
10. Battery charger for charging batteries when set is not operating, connected to the load side so that it will be energized from the mains. This will consist of:-
 - i) Transformer of adequate rating
 - ii) Rectifier
 - iii) DC Ammeter
 - iv) DC Voltmeter
 - v) Charge rate selector switch for trickle or high charge
 - vi) A lamp indicating that battery is being charged.
11. All control fuses will be so located as to be easily accessible for replacement.
12. Relay section will comprise a set of relays for following.
 - a. Automatic starting for the diesel generating set in the event of main voltage falling below a present value.
13. When the main supply is restored its quality will monitor for a period set time, then load is automatically transferred on the mains and diesel set is shut down, after a present ideal running period.
14. In the event of failure of diesel engine to start or failure of mains supply on one attempt two more starting impulse will be automatically given and if still the engine does not start due to some defects within 30 seconds of first starting impulse, it will get disconnected and locked out automatically and necessary audio and visual signal given.
15. In the event of failure of diesel generating set due to faulty starting, the main supply Contractor will get energized without any time delay on the restoration of the main supply.
16. The circuitry will make use of minimum number of relay and control wiring will be neatly provided with adequate size of copper conductor cable of suitable cross section voltage grading end tag numbered at either end.
17. Control relay both DC and AC monitors will be sturdy construction.

In the manual operation the diesel generating set will be started by the attendant by pressing the start push button and stopped down by pressing stop push button irrespective of the conditions of the main supply. Thus with this arrangement it will be possible to exercise routine test of the diesel generating set on the load without interrupting the supply of essential circuit.

In the test operating the master switch on test position will simulate mode of operation conditions similar main failure.

LIST OF APPROVED MAKES

Item no.	Details of materials	Manufacturer's name
1.	Diesel engine	Kirloskar/ Cumines/ Crompton/ Mahindra & Mahindra/MTU/ Caterpillar Engine
2.	Alternator	M/s Stamford M/s AVK Seg. & Kirloskar Green.
3.	Make of Contractor	Kirloskar, L&T/Siemens/Andrew Yule or equivalent.
4.	Make of Meter	AE/IMP or equivalent
5.	Make of HRC Fuses	L&T/Standard/EE or equivalent

BILL OF QUANTITIES

Sl. No.	Description	Unit	Qty.	Rate	Amount
1.	Design, manufacturing, testing at works, supply, installation, testing and commissioning of DG set with Diesel engine, complete with base frame, lube oil systems, Radiator, required batteries, electronic, Governor, instrumentation, 990 liters day service fuel tank in sound attenuated enclosure as per CPCB Norway, fuel piping as required, residential type exhaust silencers, alarms, engine control panel, utility piping, Resist flex make anti vibration pads. Alternators direct coupled to engine along with static excitation system and AVR panel all accessories complete as required and as per specifications and as per direction of Engineer-in-charge	Set	01		
2.	250 KVA SITC of AMF Panel complete as per specifications given at page no.10 and 11 of tender document and director of the EIC.	Set	01		
3.	Cement Concrete foundation for 250 KVA D.G. set, copper earthing station, copper strip, electrical cabling etc. for complete installation & commissioning of 250 KVA D. G. set as per site requirement, specification and direction of Engineer-in-charge.	job	01		
				TOTAL	

(Rs. In words _____ only)

Date:

Signature of tenderer

