

TENDER DOCUMENT

**SUPPLY, INSTALLATION, TESTING AND COMMISSIONING
OF
160kVA DIESEL GENERATOR SET
WITH ALL ACCESSORIES**

**FOR
HINDLABS MRI & CT SCAN FACILITY**

**AT
SAT HOSPITAL, MEDICAL COLLEGE CAMPUS,
THIRUVANANTHAPURAM, KERALA**

MAY 2017

HLL LIFECARE LIMITED
 (A Government of India Enterprise)
 Projects Division
 Corporate Head Office, Poojappura.P.O,
 Thiruvananthapuram – 695012,
 Kerala, India
 Phn: 0471- 2354949, 2775588

INVITATION FOR BIDS (IFB)

IFB No : HLL/CHO/PROJ/HCS/SAT-DG/2017-18

Date : 02-05-2017

HLL Lifecare Limited (HLL), a Government of India Enterprise is in the process of setting up HINDLABS MRI & CT Scan Facility at SAT Hospital, Govt. Medical College, Thiruvananthapuram, Kerala. For the said project, sealed and super-scribed bids are invited from competent and experienced Suppliers/Contractors who are capable to do the following work meeting their requirements as per our tender.

Sl. No	Brief Description of Item/Work	Qty	EMD in Rs
1	<u>Part - A</u> Supply of 160kVA D.G. Set with all interconnections, panels & accessories	As per Schedule IV	Rs.40,000/-
2	<u>PART – B</u> Installation, Testing & Commissioning of above DG set including first charge of consumables, exhaust piping as per Inspectorate standards, connected electrics and associated civil/structural works with comprehensive warranty as per Schedule of Work enclosed		

2. The bid documents will be available up to 15.00 Hrs. on the previous working day of the opening of the bids. The scheduled date for issue, receipt and opening of bids is as follows.

- a) Date of issue of tender document - 02-05-2017 onwards
- b) Last date and time for receipt of bids - 12-05-2017 up to 15.00 Hrs.
- c) Date and time of opening of bids - 12-05-2017, 15.30 Hrs.
- d) Address for communication, receipt and place of opening of bids:

ASSOCIATE VICE PRESIDENT (PROJECTS),
 PROJECTS DIVISION,
 HLL LIFECARE LIMITED (A Government of India Enterprise)
 Corporate Head Office, Poojappura.P.O,
 Thiruvananthapuram – 695012, Kerala, India
 Phn: 0471- 2354949, 2775588
 E-mail: sreekumar@lifecarehll.com, harikrishnankp@lifecarehll.com

3. The completed and sealed bid documents should be submitted to Associate Vice President (Projects), in the above address along with the EMD. The outer cover should bear the Enquiry No, closing date and General description of item tendered, and the words “DO NOT OPEN BEFORE” 15.30 Hrs (IST) on ----- (Indicate the Closing Date). EMD shall be submitted in the form of demand draft drawn from a nationalized bank in favor of HLL Lifecare Limited payable at Thiruvananthapuram. Bids received after due date and time will be rejected. Any bid not accompanied by EMD will be rejected.
4. Bids will be opened in the presence of Bidders representative(s) who choose to attend on the specified date and time, at the office of HLL at the address given in Clause 2 (d) above.
5. In the event of the date specified for bid receipt and opening being declared as a closed holiday for the above purchaser’s office, the due date for submission of bids and opening of bids will be the following working day at the appointed times.
6. HLL may, at its discretion, extend this deadline for submission of bids by amending the Bid Documents or any other reasons, in which case all rights and obligations of HLL and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended. HLL will not be held responsible for the postal delay, if any, in the delivery of the bidding document or the non-receipt of the same. Bids sent by Telex/Fax/Telegraph will not be accepted.
7. The EMD should be enclosed in a separate envelope and super scribed as “EMD” and to be attached in the main cover.
8. SSI or NSIC or MSME units interested in availing exemption from payment of EMD should submit a valid copy of their registration certificate issued by the concerned DIC or NSIC.
9. The Bid must include the following information;
 - a. Enquiry No.
 - b. EMD
 - c. Promised Delivery/Completion Schedule
 - d. Price Schedule in Format For Quoting (Schedule IV)
 - e. All other documents/certificate/information as specified in the bid document.
10. In addition to the invitation for bids, the bidding documents include the following schedules.

Schedule I	-	Conditions of Contract
Schedule II	-	Technical Specifications
Schedule III	-	Acceptance Form
Schedule IV	-	Schedule of Work - Format for Quoting
11. The company reserves the right to club or split the items of works, change the qualifying criteria at their discretion and to reject or cancel the Invitation for bids without assigning any reason thereof.

ASSOCIATE VICE PRESIDENT (PROJECTS)

SCHEDULE I

CONDITIONS OF CONTRACT

1) PRICE

The price quoted should be inclusive of all material cost, loading and unloading charges, all applicable taxes and other levies, labor charges, insurance etc. The **Schedule of Work** is enclosed as **Schedule IV**.

Price quoted should be firm without any escalation till the order is completely executed.

2) TAXES/DUTIES/LEVIES

The contractor shall be entirely responsible for all applicable taxes including sales tax, work contract tax, service tax, entry tax, duties, license fees etc. incurred until successful completion of contract.

3) ESCALATION

The rates quoted by the Contractor in the contract documents shall be final and shall not be subjected to any change due to the increase in labour wages or inflation in the cost of materials or any other price variations due to any reason during the stipulated time period of the contract or during the extended time period of completion.

Rates quoted should be inclusive of all cost of materials, Tools/Equipments labor charges, conveyance to site, handling charges, loading and unloading charges, hiring charges, clearing of debris, statutory payments etc.

4) COMPLETION TIME

Work should be completed within **4 WEEKS** from the date of issuing the Letter Of Intent or Work Order.

5) PAYMENT TERMS

The payment terms offered are as follows: -

- a) 60% of the total value of equipment/s will be paid against supply of equipments at site.
- b) 30% of the total value of the equipment/s and 90% of the installation & commissioning charges will be paid after successful commissioning of the equipments at site.
- c) Balance 10% of the value of the equipment/s and 10% of the installation & commissioning charges will be paid against a Performance Bank Guarantee (from a nationalized bank) equal to 10% of the total contract value valid for the guarantee period of one year.

Normally the Purchaser will not entertain any advance payment. Purchaser will not entertain the presentation of documents through Bank.

Tax Deduction: All statutory deductions like Income Tax or any other government-imposed liabilities shall be borne by the Supplier/Contractor (as applicable at the time of

execution of job) and shall be deducted from each bill submitted by the Supplier/Contractor.

6) SECURITY DEPOSIT

- 6.1 Simultaneously with the execution of the contract successful bidder shall furnish a Security deposit in the form of a Demand Draft from a nationalised bank drawn in favour of HLL Lifecare Limited, Thiruvananthapuram payable at Thiruvananthapuram or a Bank Guarantee from a nationalised bank, for an amount equal to 5% of the total contract value as Security Deposit for his faithful execution of contract. The Security deposit should be valid until successful completion of the contract and acceptance of the Equipment/works by the Purchaser/Owner and will be released after acceptance of the Equipment/works by the Purchaser/Owner. In case of a delay in the works the validity of security deposit shall be extended.
- 6.2 Within 5 days of the receipt of notification of award from the Purchaser/Owner; the successful Bidder shall furnish the security deposit in the form of a Demand Draft or Bank Guarantee in the security deposit form to be sent along with the Notification Of Award.
- 6.3 Failure of the successful Bidder to accept the notification of award or submission of security deposit within the timeframe shall constitute sufficient grounds for the annulment of the award and forfeiture of the EMD, in which even the Purchaser/Owner may make the award to the next lowest evaluated bidder or call for new bids.

7) EARNEST MONEY

- 7.1 Each bid must be accompanied by E.M.D.
- 7.2 The EMD is required to protect the Purchaser/Owner against risk of Bidder's conduct, which would warrant the security's forfeiture.
- a. The EMD shall be in the form of cash deposit or demand draft from a nationalized bank drawn in favour of HLL Lifecare Limited, Thiruvananthapuram payable at Thiruvananthapuram.
 - b. E.M.D. from unsuccessful bidders will be returned after the acceptance of order by the L1 party.
 - c. In the case of successful bidder, the Earnest Money will be returned after signing the contract, and submission of Security Deposit, which they will have to offer for the faithful execution of the contract.
- 7.3 The EMD may be forfeited:
- (a) If a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bidding Document; or
 - (b) In case of the successful Bidder, if the Bidder fails:
 - (i) to sign the Contract
 - (ii) to furnish security deposit

8) DEFECT LIABILITY PERIOD:

The defect liability period of the work, shall be 12 months from the date of completion of the work and this date will start from successful completion and handing over. If any damage or defect occurs in the work during this period then the Contractor shall rectify the damage or defect at his own expense to the satisfaction of the Purchaser/Owner. If the Contractor fails to do so, then the Purchaser/Owner shall have the authority to get the work done by other means and the expenditure incurred shall be recovered from the Contractor.

The Defect Liability Period is also referred in here as Comprehensive Warranty Period for DG set which shall be 18 months from the date of supply at site or 12 months from the date of commissioning the DG set.

During the Comprehensive Warranty Period, the Supplier should undertake routine checkups for preventive maintenance and periodical checkups like A Check, B Check. All breakdown calls along with regular maintenance should be carried out free of cost in warranty period. If the services of the Contractor/Supplier during Warranty period not found satisfactory, then HLL Lifecare Ltd., reserves the right to engage other service providers and forfeit the retention money. During the warranty period, the Supplier should attend to the Breakdowns within 3 hours of reporting the fault and restore the DG set back in Operation. The supplier should provide the hotline number of the concerned persons for reporting the breakdown.

Even if Inspection and/or tests are fully carried out by Purchaser/Owner or their representatives, the Contractor is not absolved to any degree of his responsibility to ensure that all equipment fabricated comply strictly with the requirements as per specifications given in the order, and the Purchaser/Owner shall be free to point out any defect till the defect liability period is over.

9 FORCE MAJEURE

- a. Neither the Contractor nor the Purchaser/Owner shall be considered in default in the performance of their obligations as per the Contract so long as such performance is prevented or delayed because of strikes, war, hostilities, revolution, civil commotion, epidemics, accidents, fire, cyclone, flood or because of any law and order proclamation, regulation or ordinance of Government or subdivision thereof or because of any act of God. The proof of existence of force majeure shall be provided by the party claiming it to the satisfaction of the other.
- b. The Contractor shall advise Purchaser/Owner initially by a Fax, followed by post, the beginning and end of any of the above causes of delay, failing which Purchaser/Owner shall not be liable to consider delays due to the above reasons. Notice as stated above should be given even in case where only the Contractor's bids are under the consideration of the Purchaser/Owner and no acceptance of the same has been given and detailed order issued.
- c. In the event of definite delay even if arising out of reasons due to force majeure, Purchaser/Owner shall have the right at their discretion to cancel the Order or part of the Order without any liability on their part to make any payment to the Contractor

while reserving the right to claim refund of and any payment if advanced or paid to Contractor.

10 DELAY IN WORK EXECUTION DUE TO REASONS BEYOND CONTRACTOR'S CONTROL

- 10.1) Force majeure: If the execution of work is delayed due to force majeure, then Purchaser/Owner as per the affected period may extend the time period.
- 10.2) In case work is delayed due to non-availability of stores supplied by Owner or any decision by Owner holding the progress of work, the contractor then upon any such happening causing delay shall immediately but not later than 10 days, give notice thereof in writing to the Owner, but nevertheless use constantly his best effort to prevent or make good delay. The Owner may in his discretion grant such extension of time as may appear reasonable to him and the same shall be communicated to the contractor in writing and shall be final and binding on him and the contractor shall be bound to complete the work within such extended time.

11 LIQUIDATED DAMAGES FOR DELAYS

If the work is not completed and handed over to the Purchaser/Owner within the time stipulated in the Order, Purchaser/Owner may at their option, either (1) recover from the Contractor liquidated damages at the rate of 0.5 % of the total contract value for every week of delay, subject to a maximum of 7.5 % of the total contract value, or (2) at the risk and cost of the Contractor and without prejudice to the other remedies/rights as per the Contract, terminate the order wholly or partially and complete it themselves or reassign it to other contractors.

12 SPECIAL INSTRUCTIONS

12.1 The bidder shall visit the site before quoting for the work and also take their own assessments before quoting of bids.

12.2 The work should be carried out without causing any inconvenience to the public and shall ensure that no damages are caused to the existing site premises.

12.3 During the execution of work, the contractor or authorized representative should be present at site.

12.4 All Materials, Equipment's/ Tools required for the work should be arranged by the contractor and brought to site for the timely completion of the work.

12.5 The materials used shall be as per specification and of good quality.

12.6 The Contractor has to arrange necessary insurance coverage for the machine, workmen etc. deployed by him. He shall arrange all safety measures to protect his workmen and also the properties of HLL/Hospital. The work site safety of all employees, their ESI, PF etc will have to be borne by the contractor.

- 12.7 The work should be carried out in truly professional manner, neatly finished with proper line, level and plumb. Cleanliness and finishing of the job is of utmost importance. Hence the job should be done most carefully with best workmanship. For all finishing jobs samples should be approved from the Purchaser/Owner before completely executing the work.
- 12.8 The Purchaser/Owner should be immediately informed for any discrepancy in drawings, specifications and instructions in the execution of job before actual execution of particular item having discrepancy.
- 12.9 Any item found to be having been executed with poor workmanship then the Contractor shall have to rectify /reconstruct the work as specified by Purchaser/Owner. No extra charge will be admissible in such case. If CONTRACTORS fails to do so, the Purchaser/Owner reserved the right to rectify/reconstruct the work through some other agency at the expenses of Contractor.
- 12.10 The schedule of activities as submitted by the Contractor shall have to be strictly adhered to. Regular progress reports shall have to be submitted by the Contractor giving all details for monitoring of the schedule.
- 12.11 Special care is to be taken for cleanliness of the site. After the end of day's work, the site should be cleaned immediately.
- 12.12 The Contractor shall have to co-operate with the agencies executing other works in the same area.
- 12.13 While executing the work, the Contractor shall ensure safety and security of the property of the Purchaser/Owner so as to avoid theft etc.
- 12.14 Measurement & Payment terms:

The method of measurement of completed work shall be in accordance with the standard measurement. Payment will be made on satisfactorily completion of work as per the order. Interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements in the format of HLL. All such interim payments shall be regarded as payment by way of advances against final payment only, and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re erected. Any certificate given by the officer relating to the work done or materials delivered forming part of such payment, may be modified, or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evident that any work or material so which it relates is /are in accordance with the contract and certificate. Any such interim payment,/any part there of shall not in any respect conclude, determine or affect in any way powers of the engineer in charge under the contract or any of such payment s be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

- 12.15 If contractor is executing any extra items as per direction of Engineer in charge / Officer in charge, the rates shall be worked out as per the latest CPWD Schedule of Rates and in case, the item is not included in the CPWD schedule, the rate shall be arrived as per prevailing Market rates.

- 12.16 The Quantity shown in the schedule is an approximate estimated quantity. No rate revision will be entertained if the quantity increases/decreases due to the site condition while executing the work.
- 12.17 Water and Electricity: The contractor shall make his own arrangement for water and electricity required for the works. HLL will not be responsible for the supply of either electricity or water.
- 12.18 During the execution of work, the contractor or authorized representative/s at least one person having technical qualification should be present at site.
- 12.19 **Final payment** shall be paid only after clearing the site as per direction of Engineer-in-charge/ Officer in charge.

13 CORRESPONDENCE

All correspondence relating to this Order shall be in English, to:

ASSOCIATE VICE PRESIDENT (PROJECTS),
PROJECTS DIVISION,
HLL LIFECARE LIMITED (A Government of India Enterprise)
Corporate Head Office, Poojappura.P.O,
Thiruvananthapuram – 695012,
Kerala, India
Phn: 0471- 2354949, 2775588
E-mail: sreekumar@lifecarehll.com, harikrishnankp@lifecarehll.com

14 SETTLEMENT OF DISPUTES

Arbitration shall not be a means of settlement of any dispute or claim arising out of the contract relating to the work. Any disputes or difference arising between the parties with respect to the performance of any part of this agreement or any thing connected therewith, etc shall as far as possible be mutually settled by the process of dialog and negotiation.

The Courts at Thiruvananthapuram alone shall have jurisdiction in respect of settlement of any matter arising out or in connection with the contract.

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SCHEDULE II

TECHNICAL SPECIFICATIONS

ELECTRICAL WORKS

1. The work shall be carried out by a contractor holding valid license issued by the State Government/Competent Authority for carrying out installation work of a voltage classes involved, under direct supervision of the persons holding valid certificates issued or recognized by the state government/competent authority.
2. All the materials to be used in execution of the contract shall be of approved quality and of the class most suited for the purpose specified. Before installation, the materials shall be approved by the engineer-in-charge.
3. All electrical works shall be carried out in accordance with the provisions of Indian Electricity Act, 1910 and Indian Electricity Rules, 1956 , all amended up to date.
4. The works shall also conform to relevant Indian Standard code of Practice for the type of work involved.
5. In all electrical installation works, relevant safety codes of practice shall be followed.
6. Unless otherwise specified, the work shall be carried out as per current CPWD General Specifications for Electrical Works (Part-1 Internal, Part-IV-Substations, Part VII D.G. Sets) 2013 as applicable and as per the instruction of the Engineer in Charge or his authorized representative.

D.G.SET

The DG set capacity shall be 1 No. 160 KVA, 415V with engine and alternator with suitable coupling. It shall be mounted on a common base frame as per the recommendations of engine manufacturer. The base frame shall be mounted with antivibration mounts / friction pads. The antivibration level of the Generator set shall be well within permissible limits.

The DG set shall comprise but not limited to the following systems to make it complete in all respects.

1. Fuel oil system
2. Cooling water system
3. Starting system(Auto/remote- start/stop)
4. Lube oil system
5. Exhaust system
6. Acoustic enclosure
7. Addl. Static Battery Charger

The equipment shall be capable of delivering continuously at the generator terminals a net output not less than 160kVA (prime) when operating under the site and ambient parameters and conditions. The design parameters of the generator and excitation system shall be so chosen, that the set is stable while running at any load between no load and full load and also during starting of motors / load.

Operating Conditions

The Engine alternator set shall be capable of working at any ambient temperature between 0°C to 50°C. The Engine Alternator set offered shall be continuous duty type conforming to BS 5514 for generator set applications. The set may be idle for a long period except for routine test periodically.

Fuel System

It shall be fed through engine driven fuel pump. A replaceable element of fuel filter shall be suitably located to permit easy servicing. The daily service tank shall be complete with necessary supports, gauges, connecting pipe work etc. In case of Top Mounted tanks, non return valves are must in fuel supply and return line of specified value. Pipe sealant should be used for sealing for all connections. No Teflon tape to be used.

Daily fuel service tank of manufacturer specified capacity, fabricated from M.S. sheet with inlet, outlet connections air vent tap, drain plug and level indicator (gauge) M.S. fuel piping from tank to engine with valves, unions, reducers, flexible hose connection and floor mounting pedestals, twin fuel filters and fuel injectors. The location of the tank shall depend on standard manufacturers design.

Cooling Water System

The cooling water system shall be of radiator cooling type as per bill of quantities. The radiator shall be mounted along with DG set over the common base frame. This system shall be provided with temperature switch so that when the temperature of jacket water goes above the permissible limit, the engine shall stop and give an audio visual alarm.

Starting System

The starting system shall consist of DC motor energized by 12V battery. The capacity of batteries shall be of minimum 180 AH to cater for cranking duty.

Lube Oil System

Lube oil system shall consist of an in-built sump provided in the engine, the engine driven gear pump, duplex filters and lube oil cooler etc.

A pressure regulator shall be mounted in the lube oil pump to control lube oil pressure. Filters and screens shall be provided in the L.O. system to remove foreign particles from circulation and prevent damage to bearing or mating surfaces. The L.O. system shall include L.O. pressure sensing device which shall cut off fuel supply to the engine as soon as the pressure falls below a preset value and shall give audio visual alarm. L.O. system shall be provided with pressure gauges and temperature gauges at inlet and outlet of L.O. Cooler.

Exhaust System

Exhaust Piping: All M.S. Pipes for exhaust lines shall be conforming to relevant IS. The runs forming part of factory assembly on the engine flexible connections up to exhaust silencer shall be exclusive of exhaust piping item. The work include necessary cladding of exhaust pipe work using 50 mm thick Loosely bound resin (LBR) mattress/ mineral wool/ Rockwool, density not less than 120 kg/m³ and aluminium cladding (0.6 mm thick) for the complete portion.

The exhaust pipe work includes necessary supports, foundation etc. to avoid any load & stress on turbo charger / exhaust piping. The exhaust pipe shall be *run along the existing wall of the building duly clamped/*supported on independent structure for which, the design and Drawing for such structure shall be got approved from the Engineer-in-charge.

Exhaust system should create minimum back pressure. Number of bends should be kept minimum and smooth bends should be used to minimize back pressure. Pipe sleeve of larger dia. should be used while passing the pipe through concrete wall & gap should be filled with felt lining. Schedule B' MS pipes and long bend/elbows should be used

The constituents of exhaust gas should be well within permissible limit as per the local authorities like corporation, traffic police, state pollution board etc. No set shall be accepted without the CPCB Certificate of authorized agencies.

Governing System

The governing shall be Electronic type with adjustable droop mechanism. An over speed trip mechanism shall be provided to automatically shut off the fuel and to stop the engine in case the set speed reaches about 110% of the rated speed with audio alarm indication.

Frequency Variation

The engine speed shall be so maintained that frequency variation at constant load including no load shall remain within a band of 1% of rated frequency.

Diesel Engine

The engine shall be of standard design of the original manufacturers. It should be 4 stroke cycles, water cooled, naturally aspirated/ turbo charged (as per manufacturer standard), diesel engine developing suitable BHP for giving a power rating of 160kVA/128kW as per ISO 8528- Part-1 in at the load terminals of alternator at 1500 rpm at actual site conditions.

The engine shall be capable for delivering specified Prime Power rating at variable loads for PF of 0.8 lag with 10% overload available in excess of specified output for one hour in every 12 hours. The average load factor of the engine over period of 24 hours shall be 0.85 (85%) for prime power output.

The engine shall conform to IS:10000/ ISO 3046/ BS:649/ BS 5514 amended up to date.

The engine shall be fitted with following accessories subject to the design of the manufacturer:

- I. Dynamically balanced Fly wheel
- II. Necessary flexible coupling and guard for alternator and engine.
- III. Air cleaner (dry/ oil bath type) as per manufacturer standard,
- IV. Electronic governor to maintain engine speed at all conditions of load.
- V. Daily fuel service tank of minimum 285 litre capacity as per specifications.
- VI. Dry exhaust manifold with suitable exhaust residential grade silencer to reduce the noise level.
- VII. Suitable self-starter for 12 V DC.
- VIII. Battery charging alternator unit and voltage regulator, suitable for starting.
- IX. Batteries, battery racks with interconnecting leads and terminals.
- X. Necessary gear driven oil pump for lubricating oil, priming of engine bearing as well as fuel systems as per manufacturer recommendations.
- XI. Turbo charger (as per manufacturer standard).
- XII. Lubrication oil cooler.
- XIII. Lubrication oil filters with replaceable elements.
- XIV. Crank case heater as per manufacturer recommendation.

- XV. Fuel injection: Engine should have suitable fuel injection system in order to achieve low fuel consumption
- XVI. Fuel control solenoid
- XVII. Fuel pump with engine speed adjustment
- XVIII. Engine Control Panel: fitted and having digital display not limited to the following:
 - (a) Start/stop key switch.
 - (b) kWh indication
 - (b) Lube oil pressure indication
 - (c) Water temp. indication
 - (d) RPM indication
 - (e) Engine Hours indications
 - (f) Battery charging indication
 - (g) Low lub. Oil trip indication
 - (h) High water temp. indication
 - (i) Over speed indication.
- XIX. All moving parts of the engine shall be mechanically guarded in such a manner that a human finger cannot touch any moving part.
- XX. Radiator
- XXI. Any other item not included/ specified but is a standard design of the manufacturer

Alternator

Alternator shall conform to BS:5000/ IS:4722 with standard design with IP 23 Protection, suitably rated at 128 KW / 160kVA at 0.8pf, 415 Volts, 3 phase, 4 Wires, 50 Hz., 1500 RPM, self excited (brushless excitation) and self regulated, Voltage Regulation +/-1.5% of rated voltage (from no load to full load), frequency variation limited to +/-1% and Class "H" Insulation. Alternator should be mounted on a common single base frame and coupled directly to the engine..

The excitation system shall be provided with high speed, solid state automatic voltage regulator.

Annunciation

Annunciation shall be given for the following:

- Lub oil low pressure
- Engine over speed
- High water temperature
- Control source failure
- Fuel level low
- Engine starting failure
- Battery charge low
- Earth leakage trip

STATIC BATTERY CHARGER:

The inbuilt 12V static battery charger (in addition to the battery charging alternator associated with the engine) shall be of silicon controlled rectifier (SCR) type with automatic trickle and boost charging facility, current and voltage limiting circuits to avoid over charging, short circuit, reverse polarity protection and auto cut off facility when Gen-set is ON. DC voltmeter and ammeter of approved make, SP DC MCB on DC side and SP MCB on AC side shall also be provided. DC wiring of the battery charger shall be with 2.5 sq. mm multi strand flexible copper conductor cable in heat resistant conduit/armoured cable. The battery charging current in Amps shall be 10 hours rating current as per battery AH capacity.

ACOUSTIC ENCLOSURE

The acoustic enclosure shall be of suitable size as per norms prescribed by Central Pollution Control Board (CPCB). The guaranteed noise level shall be of 75 decibels at a distance of 1 meter from the DG Set or a lesser value stipulated by CPCB. Necessary certificate to this effect from CPCB agencies is to be obtained and produced.

The enclosure shall be of totally weather, vermin and dust proof to enable the generator to operate at an ambient temperature of 48 degree Celsius . The outer casing of the container shall be of sheet steel of suitable thickness. The total enclosure shall be of powder coated. The overall dimensions of the acoustic enclosure (l x b x h) may please be indicated.

CABLING

Power cable from alternator to existing Main LT panel at the Substation viz 1 x 3.5 core 240 Sq.mm. PVC insulated aluminum armored cable shall be provided as per BOQ. All control cables between DG set and control panel are also in the scope of the DG set supplier. All end terminations to be carried out by crimping type aluminum / copper sockets of approved make. The Cable shall be routed through cable trays provided in BOQ with proper clamping with MS clamps.

EARTHING

The complete D.G set has to be earthed with 25 x 5 mm copper flat as per BOQ with duplicate earth connection separately for alternator and control panel.

2 Nos. of earth electrodes for body earth (GI pipe earthing) and 2 Nos. earth electrode(CI plate earthing) for neutral earth shall be provided as per IS-3043 . Interconnection of earth electrode, earthing of fuel oil tank, base frame etc. shall also be carried out as per relevant standards. Gland earthing to be done at all ends.

TRAINING

Training in Operation & Maintenance of DG set shall be imparted to the Concerned personnel of HLL Lifecare at the site.

SPARE PARTS

The contractor shall supply the original/manufacturer recommended spare parts required during periodic preventive maintenance work like oil filter, fuel filter, air filter, rocker cover gaskets, exhaust inlet/gaskets, water separators, fuel pipes, water hose sets, diesel hose pipes, etc.

TEST CERTIFICATES:

The firm shall submit the following test certificates on supply of the material at site:

- (i) Manufacturer test certificates for Engine, Alternator, E/A set, Control panel
- (ii) Routine test certificates for individual items, noise and pollution control type test certificate from designated test house as per specification.

TRIAL RUN

Supplier shall perform all standard tests (factory tests) on Engine and alternator and the test reports pertaining to the engine and alternator should be submitted.

The D.G. Set shall be run on no-load and on-load conditions continuously for total 6 hours. All D.G. set parameters shall be assessed and recorded during this trial run. The D.G. set shall deliver satisfactory performance during the trial run for acceptance and

taking-over. Any defects or shortcomings noted during the trial run shall be rectified by the Contractor with no extra cost.

The satisfactory performance during the trial run of the D.G. Set shall not relieve the Contractor from any of their liabilities during defects liability period or for any period thereon.

NAME PLATE MARKING AND INSTRUCTION MANUALS

A nameplate showing rating, connection diagram, year of manufacture etc., should be provided on engine and alternator; all the important major parts should bear their catalogue number, name of the parts etc. All the control wiring shall be provided with letter/number ferrules at both ends. Three sets of manuals giving the details about design specifications, special features of the equipment, schematic and wiring diagram, instructions regarding installation, maintenance /operation etc., should be supplied.

The Electrical control wiring diagram, operation and maintenance instructions shall be framed and displayed in the enclosure. The important name plate details of Engine & Alternator, date of commissioning etc shall be displayed in the enclosure.

DRAWINGS AND MANUALS

The successful bidder shall submit the following GA drawings in three copies for approval by client.

- a. General arrangement of each equipment showing fixing dimensions, static weight
- b. Foundation drawing for DG set, if required
- c. Schematic control diagram for DG control panel
- d. TB wiring diagram
- e. After approval of above drawings and after completing of erection, the contractor shall submit „As-Built“ drawings in two copies with one set of reproducible to Owner
- f. Two sets of operation and maintenance manuals for the DG sets and auxiliaries shall also be submitted to owner.

APPROVALS

It is the responsibility of the contractor to get the approval from relevant authorities like CEIG/CEA, other statutory authorities KSEB, Pollution Control Board, etc. The contractor shall prepare necessary drawings for approval by Chief Electrical Inspector to Government, obtain approval for the same, arrange for the inspection by the Electrical Inspectorate Officials and obtain safety certificate from them for commissioning the installation (This building is fed by HT power supply).

The statutory fees payable to CEIG/CEA shall be initially borne by the contractor. The same shall be reimbursed on submission of original receipts/challan.

LIST OF APPROVED MAKE OF MATERIALS

1. Alternator	Kirloskar Electric / Stamford / Leroysoner/ Crompton Greaves/Leypower /Jyothi/CAT
2. Engine	Cummins/ Greaves/ Caterpillar/ KOEL/ Ashok Leyland/ Volvo/ CAT
3. ACB	ABB / Siemens / C&S / L & T
4. Contactors & Relays	ABB / Siemens / L & T
5. Control Wires, etc.	Polycab / Havells/ Finolex/ RR Kabel/ V-Guard
6. Meters	L&T /Cadal / Rishiba
7. Push Button / Selector Switches	Essen / Vaishnav
8. Armoured Cables	Polycab / Havells/ Finolex/ RR Kabel
9. Batteries	Amara Raja / AMCO / Farukawa / Hitachi / Exide/ Prestolite / Standard/ Amron

PROFORMA OF TECHNICAL SPECIFICATION
(Details to be furnished by the tenderer along with the Bid)

Sl. No.	Description	Specification
1.	Generator KVA Rating / Model No.	160 kVA /
<u>Engine</u>		
2.	Make	
3.	Model No.	
4.	BHP Output	
5.	Cooling	
6.	Aspiration	
7.	No. of Cylinders	
8.	RPM	
9.	Compression ratio	
10.	Displacement (ltrs.)	
11.	Fuel oil	
12.	Fuel consumption at no load	
13.	Fuel consumption at 25% load	
14.	Fuel consumption at 50% load	
15.	Fuel consumption at 75% load	
16.	Fuel consumption at full load	
17.	Capacity of fuel tank (litres)	
18.	Governor	
19.	Starting system	

20.	Lub oil specification	
21.	Battery rating	

Alternator

22.	Make and Model No.	
23.	Type	
24.	Voltage	
25.	Frequency	
26.	Phase	
27.	Rated current	
28.	Power factor	
29.	Enclosure	
30.	Voltage regulation	
31.	Class of Insulation	
32.	<u>Generator set</u>	
33.	Noise level	
34.	Overall dimensions of the DG set	
35.	Approx. Total weight (Dry)	

SCHEDULE III

ACCEPTANCE FORM

(To be submitted in the letter pad of the firm indicating full name and address, telephone & fax numbers etc.)

From

To

ASSOCIATE VICE PRESIDENT (PROJECTS),
PROJECTS DIVISION,
HLL LIFECARE LIMITED (A Government of India Enterprise)
Corporate Head Office, Poojappura.P.O,
Thiruvananthapuram – 695012,
Kerala, India
Phn: 0471- 2354949, 2775588
E-mail: sreekumar@lifecarehll.com, harikrishnankp@lifecarehll.com

Dear Sir,

I / We, hereby offer to supply/fabricate/erect/install/commission the work as detailed in schedules/drawings hereto or such portion thereof as you may specify in the acceptance of Bid at the price given in the price bid and agree to hold this offer open till 90 days after the date of bid opening prescribed by the purchaser/Owner. I/We have understood the terms and conditions mentioned in the invitation for bid and Conditions of Contract furnished by you and have thoroughly examined the specifications quoted in the bid document/drawings hereto and are fully aware of the nature of the scope of work required and my/our offer is to comply strictly in accordance with the requirement and the terms and conditions mentioned above.

Yours faithfully,

SIGNATURE OF THE BIDDER

SCHEDULE IV

<u>Sub:</u>	SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 160kVA DIESEL GENERATOR SET WITH ALL ACCESSORIES				
SI No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
PART- A - SUPPLY					
1	Supply of 160KVA, silent type, water cooled, radiator type, four stroke, electric start D.G Set with acoustic enclosure and standard control panel. The engine shall be capable of taking 10% overload for one hour after 12 hours of continuous operation. The DG shall be suitable for AMF operation. The alternator shall be brushless, self excited, self regulated, SPDP enclosure, class F/H insulation, suitable for continuous operation at 1500 rpm, generating 415 V +/- 5% at 0.8 p.f, 50Hz, 0.85 load factor, 3 phase, 4 wire system generally conforming to BS: 2613 & IS: 4722.	Job	1.00		
	The DG set control panel shall be provided with all engine protection equipments, indications etc The DG set shall be suitable for AMF operation including all necessary control cabling From DG set to AMF panel. The DG set control panel shall have 250A, 25kA TPN thermal magnetic type MCCB with OL, SC and EF protection, RYB, on/off indication lamp, voltmeter, ammeter, energymeter, frequency meter etc The Low set earth fault relay shall be provided in control panel with CT of 50/5A 10VA Cl. 5P10 at DG neutral.				
	Both Engine and Alternator shall be mounted on common channel iron base Frame and with standard accessories such as antivibration pad, lead acid batteries (as specified by engine manufacturer) and engine driven battery charger along with leads, battery stand, fuel piping From fuel tank, electronic governor, Residential silencer, suitable size cable termination box, required Danger boards, signage, lettering ,external battery charger etc as required. Rate shall be inclusive of all transportation, lift & lead charges. MAKE : MODEL :				
PART -A - TOTAL					

SI No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
PART-B - WORKS					
1	Installation, Testing and Commissioning of 160KVA (Part-A, Item No.1) as per manufacturer specifications with all standard accessories complete. Along with first fill of fuel oil, lube oil and all consumables. The work should be as per Electrical Inspectorate / Pollution control board/ satutory norms.	Job	1.00		
2	Trial run of DG set for 6 hrs. on no-load and variable load condition and to record the parameters as per prescribed format. Cost of consumable (fuel oil, lube oil, etc.) to be borne by Contractor.	Job	1.00		
3	Supply & installation of exhaust gas piping of suitable diameter as per manufactures standard welded black MS, B class pipe confirming to IS:3589 cut to required lengths and installed with necessary bends, supports and clamps, anti- vibration mountings, insulation of exhaust system with mineral wool / Rockwool, 50mm thick wire mesh & aluminum cladding etc.	m	32.00		
4	Supply & Fabrication with steel sections and erection of MS base frames , MS angle channels , flat etc for supporting exhaust piping, etc. Including welding, bolting, chipping , grouting etc, including applying one antirust coat of approved primer and two finished coats of approved paint , breaking and finishing of walls, floors etc. The scope is inclusive of minor civil work as required, supply & installation of GI hardware materials, consumables, anchor fasteners, tools & tackles and necessary labour with supervision but not limited to, and complete as per approved drawings.	Kg.	850.00		
5	Supply of following size 1.1 KV grade XLPE insulated, PVC sheathed, armoured Aluminium conductor power cable conforming to IS 7098 (Part 1) amended upto date.				
5.1	4C X 2.5 Sq.mm	m	100		
5.2	3.5C x 240 Sq.mm	m	100		
6.1	Laying and fixing of one number PVC insulated and PVC sheathed/XLPE power cable of 1.1 KV grade of following size on cable tray as required. Above 185 sq. mm and upto 400 sq. mm	m	100		
6.2	Laying and fixing of one number PVC insulated and PVC sheathed/XLPE power cable of 1.1 KV grade of following size on	m	100		

SI No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
7	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV	No.	2		
8	Earthing with CI earth plate 1200 mm x 1200 mm x 6 mm thick including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal or coke and salt complete as required.	Set	2		
9	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	Set	2		
10	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	m	60		
11	Supplying and installing following size of perforated pre-painted M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required.				
	300 mm width X 50 mm depth X 1.6 mm thickness	m	15		
12	Charges for preparing drawings, schemes and proposals, submitting to the Electrical Inspectorate, obtaining necessary approval, sanction, liaisoning works etc including approvals, sanctions from SEB, obtaining necessary clearances from Pollution Control Board, other statutory agencies as may be required.	LS	1		
13	Providing C.C plinth/ bed for the DG set of approx size 4 m (L) X 1.15 m (W) X 1.85m (D) in 1:2:4 ratio, sand cushion bed at bottom of the bed, plastering of all sides for neat finishing with cement mortar, painting, etc complete as required	Cu.m	4		

SI No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
14	Providing shunt-trip mechanism in the MCCB of CT outgoing feeder in the existing MSB (to cut-off CT outgoing supply while DG running) with all necessary interconnections, control wiring, etc complete.	Job	1		
PART -B - TOTAL					
TOTAL AMOUNT IN RS. (PART-A + PART -B) INCLUSIVE OF ALL TAXES					

I agree to complete the work as per the schedule at the rates quoted by me as above.

**Seal and Signature of
BIDDER**