

IUCAA

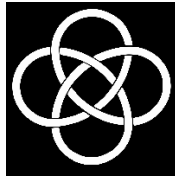
**INTER-UNIVERSITY CENTRE FOR ASTRONOMY AND ASTROPHYSICS PUNE
MAHARASHTRA - 411007**

**TENDER FOR
“SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF
650 KVA DG SET” AT IUCAA, PUNE**

TECHNICAL BID

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IUCAA

CONTACT DETAILS OF THE BIDDER FOR

Name of Bidder / Firm / Company _____

Postal Address _____

Telephone Off. _____

Telex / Fax Email ID _____

Signature & Seal of the Bidder

Name of the Signatory :

Designation :

Date: Place

Copy of Tender Advertisement

The Estate Manager, IUCAA, on behalf of the Director, Inter-University Centre for Astronomy & Astrophysics, Savitribai Phule Pune University Campus, Ganeshkhind, Pune – 411007, invites technical & financial bids from reputed vendors/bidders for **“SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 650 KVA DG SET” AT IUCAA, PUNE.**

Interested parties may view and download the tender document from the Government Central Procurement Portal <http://eprocure.gov.in/eprocure/app> . It is also available on IUCAA’s website at <https://www.iucaa.in/tenders>

IUCAA reserves the right to reject any or all of the tenders without assigning any reason.

Estate Manager, IUCAA

IMPORTANT MILESTONES AND CONTACT INFORMATION

1.	Date of commencement	8 th (Eighth) day after the letter of intent is received by the bidder of start the work.
2.	Date of Completion	2 (Two) calendar months from the 8 th day of receipt work order
3.	Defects liability Period	36 (Thirty-Six) calendar months from the date of completion of work.
4.	Period of final measurements	One week from the date of submission of Final bill with all necessary papers.
5.	The Interim Certificate / Running Bill Value	Minimum assessed bill value should not be less than Rupees 30,00,000 Lakhs.
6.	Period of Honoring Certificate	Thirty days from the request letter.
7.	Earnest money Deposit (EMD)	Rs. 2,54,000/- (Rs. Two Lakh Fifty-Four Thousand Only) in the form of online payment. Refund: EMD of unsuccessful bidders during first stage (technical evaluation) shall be returned within 30 days of declaration of result of the first stage, i.e. technical evaluation. Bids of the unsuccessful bidders shall be returned to them earliest after expiry of the final bid validity and latest on or before the 30 th day after the award of the Contract / Work Order.
8.	Security Deposit (SD)	The SD will be 5% of the Accepted tender value/final Contract/Work Order value. The EMD already submitted will be converted into Security Deposit and the balance amount of SD will be recovered from first 2 RA bills in equal installments. Security Deposit will be refunded to the vendor on completion of all contractual obligations including the Defect Liability Period + 60 days.
9.	Performance Bank Guarantee (PBG)	The PBG will be 5% of the accepted tender value. The same has to submitted within 21 days from the award of contract/letter of Intent/work order. The PBG will be released after satisfactory completion of warranty period + 60 days. The PS can also be submitted in the form of Performance Bank Guarantee (PBG) drawn on a Nationalized Bank. If, PS is not submitted within 30 days, then the penalty of Rs. 5000/- per day will be applied.
10.	Contact information of IUCAA representative for visit to site, technical information / clarification, etc.	Mr. Nitin Ohol Estate Manager, IUCAA Tel. 020-25604334, Email: nitin_ohol@iucaa.in , tenders.estate@iucaa.in

SECTION - I
TENDER NOTICE / INFORMATION

The Director, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Post Bag 4, Ganeshkhind, Savitribai Phule Pune University Campus, Pune 411 007, invites bids in two-bid system, i.e. "Technical Bid" and "Financial Bid" from reputed vendors towards **"Supply, Installation, Testing and Commissioning (SITC) of 650 KVA DG SET" at IUCAA, Pune.**

Tender available on CPPP	: 06/02/2025 at 1700 hrs.
Submission of questionnaire for Pre-Bid Meeting	: 14/02/2025 up to 1100 hrs
Pre-Bid Meeting	: 18/02/2025 at 1100 hrs.
Closing date & time for receipt of Tender	: 27/02/2025 at 1100 hrs.
Tender opening date & time	: 28/02/2025 at 1100 hrs.
Earnest Money Deposit (EMD)	: 2,54,000/- (Rs. Two Lakh Fifty Four Thousand Only)

- 1) Bidders shall ensure that their tenders, complete in all respects, are uploaded at <https://eprocure.gov.in/eprocure/app> on or before the closing date and time indicated as above.
- 2) EMD should be paid through **NEFT/RTGS** only. Photo copy of transaction ID or UTR no. should be uploaded along with technical bid. Micro and Small Enterprises (MSEs) are provided tender documents free of cost and are exempted from payment of earnest money, subject to furnishing of relevant valid certificate for claiming exemption.
- 3) Tender fees shall not be applicable for tender documents downloaded by the bidder. (In order to promote wider participation and ease of bidding, no cost of tender document will be charged for tender documents downloaded or uploaded on CPPP by the bidder)
- 4) The Minimum turnover of the bidder shall not be less than Rs. 1.70 Crores (Rupees One Crore Seventy Lakh only) per annum for a minimum of three years out of the last five financial years, i.e. 2019-2020, 2020-2021, 2021-2022, 2022-2023 and 2023-2024.
- 5) In the event of any of the above-mentioned dates being declared as a holiday / closed day for IUCAA, the tenders will be received/opened on the next working day at the appointed time.
- 6) The Estate Manager, IUCAA, Pune - 411007 on behalf of IUCAA reserves the right to postpone the date of opening of tender without assigning any reason thereof.
- 7) Technical Bid consists of all documents mentioned in the Technical Bid form along with EMD. Financial Bid consists of the prices and for all Commercial Terms and Conditions. A tender in which any of the prescribed condition(s) is not fulfilled or any condition including that of conditional rebate are put forth by any bidder then their bid shall be summarily rejected. However, tenders with unconditional rebate will be considered.
- 8) IUCAA reserves the right to reject any or all of the tenders without assigning any reason thereof.

Estate Manager
Inter-University Centre for Astronomy and Astrophysics
Post Bag 4, Ganeshkhind, Pune - 411007.
Tel. (020) 25604100
Email- tenders.estate@iucaa.in

TECHNICAL BID FORM

(To be filled by Bidder)

1	Bidder's Name (firm/company Name) and Address	
2	Company Registration / Shop Act License No. and Validity	
3	The Bidder must have minimum five years valid Dealership Certificate from OEM or OEM in one brand only.	
4	Nature of Business & Establishment Year	
5	Telephone Nos. <i>Mobile</i> <i>No. Fax</i> <i>Nos.</i>	
6	Contact Person Name <i>Designation</i> <i>Mobile</i> <i>E-mail</i>	
7	EMD Paid (Proof to be Attached)	
8	NSIC / MSME Registration Certificate (valid certificate to be attached if any)	
9	PAN Details PAN No. (Photocopy to be attached)	
10	PF/ESI/GST/Professional Tax details Reg. no. PF (Copy to be attached) Reg. no. ESI (Copy to be attached) Reg no. GST (Copy to be attached) Reg. No. Profession Tax (Copy to be attached)	
11	Organizational Capability (staff strength) <i>No. of Engineers ...</i> <i>No. of Supervisors ---</i> <i>No of Technicians...</i> <i>Quality Engineers ...</i>	
13	Financial capacity over last 5 years (Income tax return/Certified balance sheet of the firm along with CA's certificate for the year's turnover) FY 2019-2020 FY 2020-2021 FY 2021-2022 FY 2022-2023 FY 2023-2024	
14	Last Five years continuous experience of the firm in the field of providing such services in Central Govt. establishment/Autonomous bodies of GOI/Corporation of GOI/Reputed Public or Private Organizations (Provide details in enclosed tabular form)	
15	Provide following details: Minimum five numbers of 650 KVA and above capacity of satisfactory installations/commissioning completed within a last year of similar nature. Client Certificate to be attached for all the works.	

	a) Name & address of the project Type of Work Start date Completion date Installed DG Set Capacity Final Bill Value Scope of work <i>Client contact details (Name, tele, fax, e-mail).</i>
	b) Name & address of the project Type of Work Start date Completion date Installed DG Set Capacity Final Bill Value Scope of work <i>Client contact details (Name, tele, fax, e-mail).</i>
	c) Name & address of the project Type of Work Start date Completion date Installed DG Set Capacity Final Bill Value Scope of work <i>Client contact details (Name, tele, fax, e-mail).</i>
16	List of Clients for whom the bidder has executed works of similar nature
17	List along with details of any arbitration cases / legal disputes on Current/ previous projects – (Mention name of project, reason for dispute, party filing the suit and its current status)
18	Address of DG Set Service Centre in Pune
19	List any awards, recognitions on previously executed projects
20	Address of Office
21	Prepared and submitted by (Name & Signature)
Notes: – The Inter-University Centre for Astronomy & Astrophysics, Pune reserves the right to accept or reject any or all applications without assigning any reason. The vendors/bidder has to fill/complete the technical bid form and Compliance sheet mentioned in clause no.17.8 in all respects. Every statement made in the technical bid format should be supported by documentary proof for consideration and all pages of the tender should be verified and signed by the authorized person in this behalf. Otherwise the tender is liable to be rejected. Please support Completed Work (Form No. I) and Work in hand (Form No. II) information with copy of the Work order/Contract from the client, Otherwise the tender is liable to be rejected.	

Date:

Yours faithfully,

Place:

(Signature of the Authorized person)

Name:

Designation:

Seal:

SECTION - II
COMMERCIAL TERMS

1. **Introduction:** IUCAA invites bids in two-bid system, i.e. “Technical Bid” and “Financial Bid” from reputed vendors towards “**Supply, Installation, Testing and Commissioning (SITC) of 650 KVA DG SET” at IUCAA, Pune.**
 - 1.1. This section provides the relevant information as well as instructions to assist the prospective bidders in preparation and submission of tenders. It also includes the mode and procedure to be adopted by IUCAA for receipt and opening as well as scrutiny and evaluation of tenders and subsequent placement of contract.
 - 1.2. Before formulating the tender and submitting the same to IUCAA, the bidder should read and examine all the terms, conditions, instructions etc. contained in the tender documents. Failure to provide and/or comply with the required information, instructions etc. incorporated in these tender documents may result in rejection of their tender.
2. **Language of Tender:** The tender submitted by the bidder and all subsequent correspondence and documents relating to the tender exchanged between the bidder and IUCAA shall be written in the English language, unless otherwise specified in the tender enquiry. However, the language of any printed literature furnished by the bidder in connection with its tender may be written in any other language provided the same is accompanied by an English translation and, for purposes of interpretation of the tender, the English translation shall prevail.
3. **Eligibility Criteria for Bidders:** The vendors should meet the following criteria to qualify in the tendering process. (Sufficient proof with authorized work order & completion certificate to be submitted)
 - 3.1. The vendor should have completed minimum five similar DG Set capacity (i.e. 650 KVA and above) satisfactory supply & installation within a last year.
 - 3.2. The bidder must have minimum five years valid Dealership Certificate in one brand only from OEM or OEM.
 - 3.3. The Minimum turnover of the bidder shall not be less than Rs. 1.70 Crores (Rupees One Crore Seventy Lakh only) per annum for minimum three years out of last five financial years. The bids of those bidders who do not fulfil any of the above-mentioned criterion shall be summarily rejected.
4. **Eligible Goods and Services:** All goods and related services to be supplied under the contract shall have their origin in India or other countries, subject to any restriction imposed in this regard. The term “origin” used in this clause means the place where the goods are mined, grown, produced, or manufactured or from where the related services are arranged and supplied.
5. **Tendering Expenses:** The bidder shall bear all the costs and expenditure incurred and/or to be incurred by it in connection with its tender including preparation, mailing and submission of its tender and for subsequent processing of the same. IUCAA will, in no case be responsible or liable for any such costs, expenditure etc. regardless of the conduct or outcome of the tendering process.
6. **Content of Tender Enquiry Documents:** The relevant details required for SITC of DG Set & services, the terms, conditions and procedure for tendering, tender evaluation, placement of contract, the applicable contract terms and, also, the standard formats to be used for this purpose are incorporated in the above-mentioned documents. The interested bidders are expected to examine all such details etc. to proceed further.
7. **Amendments to Tender Enquiry Documents:**
 - 7.1. At any time prior to the deadline for submission of tenders, IUCAA may, for any

reason it deems fit, modify the tender enquiry documents by issuing suitable amendment(s) to it. All such amendments shall form part of this tender document and shall be binding on all the bidders.

7.2. In order to provide reasonable time to the prospective bidders to take necessary action in preparing their tenders as per the amendments, IUCAA may, at its discretion extend the deadline for the submission of tenders and other allied time frames, which are linked with that deadline.

8. **Clarification of Tender Enquiry Documents & Pre-Bid Meeting:** A bidder requiring any clarification or elucidation on any issue of the tender enquiry documents may take up the same with IUCAA in writing by e-mail. A pre-bid technical meeting will be held at IUCAA, Pune on **18/02/2025 at 11:00 hrs.** to discuss and resolve the queries and doubts, if any from the prospective bidders. Clarifications/questionnaire sought should be sent by email to tenders.estate@iucaa.in latest by **11:00 hrs on 14/02/2025**. Clarifications/discussions/minutes of the pre-bid meeting will form a part of the tender document. Pre-bid meeting will be arranged at IUCAA campus.

One Set of hard copy of tender document & drawings shall be available at IUCAA office during office hours.

9. **Contacting IUCAA:**

9.1. From the time of submission of tender to the time of awarding of the contract, if a bidder needs to contact IUCAA for any reason relating to this tender enquiry and/or its tender, it should do so only in writing to tenders.estate@iucaa.in

9.2. In case a bidder attempts to influence IUCAA in its decision(s) during scrutiny, comparison and/or evaluation of tenders and/or awarding the contract, the tender of such a bidder shall be liable for rejection in addition to appropriate legal action(s) being taken against such a bidder at the discretion of IUCAA.

10. **Corrupt or Fraudulent Practices:** IUCAA requires that the bidders who wish to bid for against IUCAA's tender have the highest standards of ethics. IUCAA shall reject bids of those bidders who are found to be engaged in corrupt and/or fraudulent practices. This also applies to a successful bidder who has been awarded the contract and is found to be engaged in corrupt or fraudulent practices during the execution of the contract.

11. **Interpretation of the clauses in the Tender Document/Contract Document:** In case of any ambiguity in or dispute arising out of or related to (including the interpretation of any of the clauses in this tender document/purchase order/contract), decision of the Director, IUCAA or his nominee shall be final and binding on all parties.

12. **Tender currencies:** The bidder shall quote only in Indian Rupees.

13. **Tender Prices:** Bidder has to check and fill all the fields mentioned in the price bid. The quoted rates shall be inclusive of all the relevant taxes excluding GST. The GST shall be calculated automatically on the Gross Total and shown separately at the end in the BOQ sheet. The Net Total shall be the summation of the Gross Total and the GST. All the bidders should ensure that they are GST compliant and their quoted tax structure/rates are as per GST Law.

14. **Taxes:** GST shall be levied as per prevailing rates.

15. **Documents establishing Good's Conformity to Tender Enquiry document:**

15.1. The bidder shall provide in its tender the required as well as the relevant documents like technical data, literature, drawings etc. to establish that the goods and services offered in the tender, fully conform to the goods and services specified by the procuring entity in the tender documents. For this purpose, the bidder shall also provide a clause-by-clause commentary on the technical specifications and other technical details incorporated by the procuring entity in the tender documents to establish technical

responsiveness of the goods and services offered in its tender. In case, there is any variation and/or deviation between the goods & services prescribed by the procuring entity and that offered by the bidder, the bidder shall list out the same in a chart form without ambiguity and provide the same along with its tender. If a bidder furnishes wrong and/or misleading data, statement(s) etc. about technical acceptability of the goods and services offered by it, its tender will be liable to be ignored and rejected in addition to other remedies available to the procuring entity in this regard.

16. **Earnest Money Deposit (EMD):** The Earnest Money is required to protect IUCAA against the risk of the bidder's unwarranted conduct as amplified under GCC.

16.1. **The amount of EMD will be 2,54,000/- (Rs. Two Lakh Fifty-Four Thousand Only).**

16.2. The EMD shall be denominated in Indian Rupees.

16.3. Scanned copy of the EMD paid receipt (as the case may be) shall be uploaded along with the Technical Bid.

16.4. The EMD shall be furnished through **NEFT/RTGS** only. IUCAA's bank details for the purpose of payment of EMD are as follows: -

Name of the Beneficiary: Inter-University Centre for Astronomy & Astrophysics Bank Account Number - 98060100000188

Nature of Bank Account - Savings Bank Account,

MICR NO. - 411012053 Name of the Bank - Bank of Baroda

Address of the branch - Bank of Baroda, IUCAA Extension counter, Pune University Campus, Pune - 411007.

Bank Branch Code - EXTP00,

IFSC Code- BARB0EXTP00, Swift Code - BAR B IN BB PCB

17. Unsuccessful bidder's earnest money shall be returned to them without any interest after issuing the work order / LOI to the successful bidder. In case of the bidder whose offer is accepted, the EMD shall be converted into **Security Deposit**. [Please refer Section III, Clause 26, for further details on Security Deposit.]

17.1. EMD of a bidder will be forfeited, if the bidder withdraws or amends their bid or impairs or derogates from the tender in any respect within the period of validity of their tender. The successful bidder's earnest money shall be forfeited, if they fail to furnish the balance amount of Performance security within the aforementioned period.

17.2. Micro and Small Enterprises (MSEs) are provided tender documents free of cost and are exempted from payment of earnest money, subject to furnishing of relevant valid certificate for claiming exemption. MSEs must provide proof of their being registered as MSE (indicating the terminal validity date of their registration) for the item tendered, with any agency mentioned in the notification of the Ministry of Micro, Small and Medium Enterprises (Ministry of MSME), indicated on the website of MSME.

18. **Security Deposit** will be released upon completion of all contractual obligations including Defect Liability Period + 60 days.

19. **Tender Validity:**

19.1. The Bids shall remain valid for acceptance for a period of **180 days** from the date of tender opening prescribed in the tender document. Any bid valid for a shorter period shall be treated as unresponsive and rejected summarily.

19.2. In exceptional cases, the bidders may be requested by IUCAA to extend the validity of their bids up to a specified period. Such request(s) and responses thereto shall be conveyed by e-mail followed by registered-post/courier. In all such cases the bidders will

(i) have to extend the bid validity without any change or modification in their original tender and

- (ii) extend the validity period of the EMD accordingly. However, EMDs of those bidders who express their inability to do so shall not be forfeited and their bids shall not be considered for further process.

19.3. In case the day up to which the tenders are to remain valid falls on/ is subsequently declared as a holiday or closed day for IUCAA the tender validity shall automatically be extended up to the next working day.

20. **Withdrawal of Tender:** No tender should be withdrawn after the deadline for submission of tender and before expiry of the tender validity period. If a bidder withdraws the tender during this period, it will result in forfeiture of the earnest money furnished by the bidder in its tender.

21. **Preparation of Bids:**

21.1. For preparation of bids, the bidders shall search the tender from published tender list available on site and download the complete tender document and shall consider corrigendum issued, if any, before submitting their bids. After selecting the tender document, the same shall be moved to the 'My favorite' folder of bidders account from where bidder can view all the details of the tender document.

21.2. Bidder shall go through the tender document carefully to understand the documents required to be submitted as part of the bid. Bidders shall note the number of covers in which the bid documents have to be submitted, the number of documents – including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of their bid.

21.3. Any pre-bid clarifications if required, then same may be obtained online through the tender site, or through the contact details given in the tender document.

21.4. Bidders should get ready in advance the bid documents in the required format (pdf/xls/rar/dwf/jpg formats) to be submitted as indicated in the tender document/schedule. **Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.**

21.5. Bidders can update well in advance, the documents such as experience certificates, annual report, PAN, GST & other details etc., under "My Space / Other Important Document" option, which can be submitted as per tender requirements. This will facilitate the bid submission process faster by reducing upload time of bids.

21.6. The tender documents may be downloaded from <http://eprocure.gov.in/eprocure/app> till the last date of submission of tender. The Tender must be submitted online through CPP Portal <http://eprocure.gov.in/eprocure/app>

21.7. **The bidder should submit the bid online in two parts viz. Technical Bid and Financial Bid.** Technical Bid in cover-1 & Financial Bid in ".xls" format in Cover-2.

22. **Submission of Technical and Financial Bids:**

22.1. All pages of the bid (except for un-amended printed literature) shall be initialed by the person or persons signing the bid. The bidder's name stated on the proposal shall be the exact legal name of the firm.

22.2. Any other condition or guideline for submission of the bids shall be notified by IUCAA if it finds necessary.

22.3. IUCAA may, at its discretion, extend the deadline for the submission of bids by amending the bidding documents, in which case all rights and obligations of IUCAA and Bidder previously subject to the deadline will thereafter be subject to the deadline as extended.

22.4. At any time prior to the deadline for submission of bids, IUCAA may, for any reason,

whether at its own initiative or in response to a clarification requested by a prospective bidder, notify changes in the bidding documents through an amendment.

22.5. The amendments, if any, shall be notified on the CPP portal and the amendments shall be binding on all the bidders. Hence, the bidders shall view the notification in complete before submitting their bids.

22.6. The bidder responding to announcement shall be deemed to have read and understood the documents in complete. Where counter terms and conditions have been offered by the bidder, the same shall not be deemed to have been accepted by IUCAA, unless a specific written acceptance thereof is obtained.

23. SUBMISSION OF BIDS:

- i. Bidder should log into CPP Portal well in advance for bid submission so that he/ she upload the bid in time i.e., on or before the bid submission time. Bidder will be responsible for any delay.
- ii. Bidder should submit the EMD as per the instructions specified in the NIT / tender document. The details of the EMD should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise, the uploaded bid will be rejected.
- iii. While submitting the bids online, the bidder shall read the terms & conditions (of CPP portal) and accept the same in order to proceed further to submit their bid.
- iv. Bidder shall digitally sign and upload the required bid documents one by one as indicated in the tender document.
- v. Bidders shall note that the very act of using Digital Signature Certificate (DSC) for downloading the tender document and uploading their offers is deemed to be a confirmation that they have read all sections and pages of the tender document without any exception and have understood the complete tender document and are clear about the requirements of the tender document.
- vi. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document. For the file size of less than 1 MB, the transaction uploading time will be very fast.
- vii. **If price quotes are required in xls format, utmost care shall be taken for uploading Schedule of quantities & Prices and any change/ modification of the price schedule shall render it unfit for bidding.**
Bidders shall download the Schedule of Quantities & Prices, in .xls format and save it without changing the name of the file. Bidder shall quote their rate in figures in the appropriate cells, thereafter save and upload the file in financial bid cover (Price bid) only.
If the template of Schedule of Quantities & Prices file is found to be modified/corrupted in the eventuality by the bidder, the bid will be rejected, including forfeiture of EMD.
The bidders are cautioned that uploading of financial bid elsewhere i.e. other than in cover 2 will result in rejection of the tender.
- viii. Bidders shall submit their bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). **The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.**
- ix. After the bid submission (i.e. after Clicking “Freeze Bid Submission” in the portal), the bidders shall **take print out of system generated acknowledgement** number and keep it as a record of evidence for online submission of bid, which will also act as an

- entry pass to participate in the bid opening.
- x. Bidders should follow the server time being displayed on bidder's dashboard at the top of the tender site, which shall be considered valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system.
 - xi. All the documents being submitted by the bidders would be encrypted using PKI (Public Key Infrastructure) encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128-bit encryption technology.
 - xii. Technical & Financial bids has to be uploaded on or before **Bid Submission End Date & Time** mentioned in the tender documents.

24. Assistance to Bidders:

- i. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contract person indicated in the tender. The contact number for the IUCAA helpdesk is 020-25604134/36 between 10:30 hrs to 17:00 hrs.
- ii. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24X7 CPP Portal Helpdesk. The 24 x 7 Help Desk Number 0120-4200462, 0120-4001002 and 0120-4001005. The helpdesk email id is support-eproc@nic.in
- iii. All interested eligible bidders are requested to submit their bids online on CPP Portal <http://eprocure.gov.in/eprocure/app> as per the criteria given in this document:
Technical Bid should be upload online in cover-1.
Financial Bid should be upload online in cover-2.
Both Technical and Financial Bid covers should be placed online on the CPP Portal (<http://eprocure.gov.in/eprocure/app>).

25. TECHNICAL BID (Cover-1): Signed and Scanned copies of the Technical bid documents as under must be submitted online on CPPP Portal: <http://eprocure.gov.in/eprocure/app>. List of Documents to be scanned and uploaded (Under Cover-1) within the period of bid submission Otherwise the tender is liable to be rejected.:

- i. **Scanned Copy of EMD paid receipt / MSE registration certificate (indicating the terminal validity date of their registration)**
- ii. **Scanned copy of duly filled Technical Bid form (Section I) along with supporting documents & commercial / legal terms & conditions with proper seal and signature of authorized person on each page of the bid submitted.**
- iii. **Scanned copy of Work Completion Certificate of Minimum five numbers of satisfactory supply & installations/commissioning of 650 KVA and above capacity DG Sets within a last year from Government / Semi Government/Public sector or reputed private bodies (in Form I). The bidder will have to produce a certificate from an officer not below the rank of Deputy Engineer, for the works pertaining to Govt. Dept. or Semi Govt. Institutes / Dept. or equivalent from their respective Heads. The details of ongoing works (Forms II)**
- iv. **Scanned copy of Abstract of work done (annual financial turnover) shall not be less than Rs 1.70 Cores (Rupees One Crore Seventy Lakh only) per annum in SITC of 650 KVA DG SET work during last five financial years (i.e., 19-20, 20-21, 21-22, 22-23, 23-24) (Form III). The work done certificates issued by Govt./Semi Govt./Reputed private bodies to be attached in support of turnover. The certificate shall have name of work, date of start, date of completion and amount of work done of in last three financial years as above. The turnover certified by chartered**

- accountant shall not be accepted. Income tax returns certificate should be attached.
- v. **Scanned copies of the duly filled Declaration Form (Form I to VIII).**
 - vi. **Scanned copy of valid Dealership Certificate from OEM or OEM minimum five years in one brand only.**
 - vii. **Scanned copy of Partnership Deed/Certificate of Registration in case of Pvt. Ltd. Company** with list of Directors, their names and address with telephone numbers, if the tenderer is a partnership firm / Pvt. Ltd. Company, Power of Attorney / Resolution of Board of Director's for authorized signatory.
 - viii. **Scanned copy of Declaration** regarding any ongoing disputes/litigations (or any history thereof) with respect to any work executed / being executed by the tenderer with details of disputes/litigations, if applicable
 - ix. **Scanned copy of make of goods/items offered as per approved make list (Annexure-1).**
 - x. **Scanned copy of Compliance sheet of DG Set (Annexure - 2)**
 - xi. **Scanned documents of all eligibility criteria should be attached Copy of work orders, ESI, PF, GST, PAN, Profession Tax, Shop Act License, IT returns etc.**

26. FINANCIAL BID (Cover-2):

- i. The currency of all quoted rates shall be Indian Rupees.
- ii. In preparing the financial bids, bidders are expected to consider the requirements and conditions laid down in this Tender document. The financial bids should be uploaded online as per the specified ".xls" format i.e. Price Bid Excel sheet attached as 'xls' with the tender and based on the scope of work, service conditions and other terms of the tender document. It should include all costs associated with the Terms of Reference/Scope of Work of the assignment.

27. Tender Opening:

- 27.1. IUCAA will open the tenders at the specified date and time and at the specified place as indicated. In case the specified date of tender opening falls on declared holiday or closed day for the purchaser, the tenders will be opened at the appointed time and place on the next working day.
- 27.2. In the case of two-bid system mentioned above, the technical bids are to be opened in the first instance, at the prescribed time and date. These bids shall be scrutinized and evaluated by the competent authority / committee with reference to parameters prescribed in the tender document. Thereafter, in the second stage, the financial bids of only the technically qualified / acceptable offers (as decided in the first stage) shall be opened for further scrutiny and evaluation by giving an advance intimation to the technically successful bidders. IUCAA reserves the right to select the vendor on the basis of past performance and experience of the firm. The decision of IUCAA shall be final and representation of any kind shall not be entertained on the above. IUCAA shall have no obligation to convey reason for rejection of any bid.

28. Preliminary Scrutiny of Tenders:

- 28.1. The tenders will first be scrutinized to determine whether they are complete and meet the essential and important requirements, conditions etc. as prescribed in the tender enquiry document. The tenders, which do not meet the basic requirements, are liable to be treated as unresponsive and shall be ignored.
- 28.2. The following are some of the important aspects, for which a tender may be treated to be unresponsive and shall be ignored;
 - i. Tender is unsigned incomplete.
 - ii. Tender is submitted without necessary supporting papers
 - iii. Tender validity is shorter than the required period.

- iv. Required EMD has not been provided/paid.
- v. Bidder has not agreed to give the required performance security.
- vi. Bidder has not agreed to essential condition(s) specially incorporated in the tender enquiry.
- vii. Tender is conditional tender.

29. **Minor Informality /Irregularity /Non-Conformity:** If during the preliminary examination, IUCAA finds any minor informality or irregularity or non-conformity in a tender, IUCAA may waive the same, provided it does not constitute any material deviation or financial impact and, also, does not prejudice or affect the ranking order of the bidders. In case, if IUCAA conveys its observation on such 'minor' issues to the bidder by asking the bidder to respond by a specified date, and the bidder does not reply by the specified date or gives evasive reply without clarifying the point at issue in clear terms, such tender will be liable to be ignored.

If IUCAA observed, that bidder had inadvertently missed out to submit some documents asked in the technical bid form, then IUCAA may ask bidder to submit the same. IUCAA may convey its observation on such 'minor' issues to the bidder by registered/speed post/email/fax etc. asking the bidder to respond by a specified date. If the bidder does not reply by the specified date or gives evasive reply without clarifying the point at issue in clear terms, such tender shall be liable to be rejected/ignored.

30. **Code of Integrity in Public Procurement; Misdemeanors and Penalties: -**

30.1. **Code of Integrity:** Procuring authorities as well as bidders, suppliers, bidders, and consultants - should observe the highest standard of ethics and should not indulge in following prohibited practices, either directly or indirectly, at any stage during the Tender Process or during the execution of resultant contracts:

(1) **"Corrupt practice"** - making offer, solicitation or acceptance of a bribe, reward or gift or any material benefit, in exchange for an unfair advantage in the Tender Process or to otherwise influence the Tender Process;

(2) **"Fraudulent practice"** - any omission or misrepresentation that may mislead or attempt to mislead so that financial or other benefits may be obtained or an obligation avoided. Such practices include a false declaration or false information for participation in a tender process or to secure a contract or in the execution of the contract;

(3) **"Anti-competitive practice"** - any collusion, bid-rigging or anti-competitive arrangement, or any other practice coming under the purview of the Competition Act, 2002, between two or more bidders, with or without the knowledge of the Procuring Entity, that may impair the transparency, fairness, and the progress of the Tender Process or to establish bid prices at artificial, non-competitive levels;

(4) **"Coercive practice"** - harming or threatening to harm persons or their property to influence their participation in the Tender Process or affect the execution of a contract; (5) **"Conflict of interest"** - participation by a bidding firm or any of its affiliates who are either involved in the Consultancy Contract to which this procurement is linked; or if they are part of more than one bid in the procurement; or if their personnel have a relationship or financial or business transactions with any official of procuring entity who are directly or indirectly related to tender or execution process of contract; or improper use of information obtained by the (prospective) bidder from the Procuring Entity with an intent to gain unfair advantage in the Tender Process or for personal gain;

(6) **"Obstructive practice"** - materially impede procuring entity's investigation into

allegations of one or more of the above mentioned prohibited practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/ or by coercive practices mentioned above, to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding the procuring entity's rights of audit or access to information;

30.2. **Obligations for Proactive Disclosures:**

- i. Procuring authorities, bidders, suppliers, bidders, and consultants are obliged under this Code of Integrity to *suo-moto* proactively declare any conflict of interest (coming under the definition mentioned above - pre-existing or as and as soon as these arise at any stage) in any Tender Process or execution of the contract. Failure to do so shall amount to a violation of this code of integrity.
- ii. Any bidder must declare, whether asked or not in a bid-document, any previous transgressions of such code of integrity during the last three years or of being under any category of debarment by the Central Government or by the Ministry/ Department of the Procuring Organization from participation in Tender Processes. Failure to do so shall amount to a violation of this code of integrity.

31. **Misdemeanors and Penalties:** The following shall be considered misdemeanors - if a bidder/ bidder either directly or indirectly, at any stage during the Tender Process or during the execution of resultant contracts:

- i. violates the code of Integrity mentioned herein or the Integrity Pact, if included in the Tender/ Contract;
- ii. has been convicted of an offence:
 - a) under the Prevention of Corruption Act, 1988; or
 - b) the Indian Penal Code or any other law for the time being in force for causing any loss of life or property or causing a threat to public health as part of the execution of a public procurement contract.
- iii. It is determined by the Government of India to have doubtful loyalty to the country or national security consideration.
- iv. Employs a government servant, who has been dismissed or removed on account of corruption or employs a non-official convicted for an offence involving corruption or abetment of such an offence, in a position where he could corrupt government servants or employs a government officer within one year of his retirement, who has had business dealings with him in an official capacity before retirement.

32. **Penalties for Misdemeanors:** Without prejudice to and in addition to the rights of the procuring entity to other remedies as per the Tender-documents or the contract, if the procuring entity concludes that a (prospective) bidder/ bidder directly or through an agent has violated this code of integrity or committed a misdemeanor in competing for the tender or in executing a contract, the procuring entity shall be entitled to take appropriate measures, including the following:

(a) **if his bids are under consideration in any procurement:**

- Enforcement of Bid Securing Declaration in lieu of forfeiture or encashment of Bid Security.
- calling off of any pre-contract negotiations, and;
- rejection and exclusion of Bidder from the Tender Process

(b) **if a contract has already been awarded:**

- Termination of Contract for Default and availing all remedies prescribed

thereunder;

- Encashment and/ or Forfeiture of any contractual security or bond relating to the procurement;
- Recovery of payments including advance payments, if any, made by the procuring entity along with interest thereon at the prevailing rate (MIBID - Mumbai Interbank Bid Rate);

(c) **Remedies in addition to the above:** In addition to the above penalties, the procuring entity shall be entitled, and it shall be lawful on his part to:

- File information against Bidder or any of its successors, with the Competition Commission of India for further processing, in case of anti-competitive practices;
- Initiate proceedings in a court of law against Bidder or any of its successors, under the Prevention of Corruption Act, 1988 or the Indian Penal Code or any other law for transgression not addressable by other remedies listed in this sub-clause.
- Remove Bidder or any of its successors from the list of registered suppliers for a period not exceeding three years. Suppliers removed from the list of registered bidders or their related entities may be allowed to apply afresh for registration after the expiry of the period of removal.
- Initiation of suitable disciplinary or criminal proceedings against any individual or staff found responsible.

33. Opening of Financial bids:

33.1. The Financial bids of all eligible, technically qualified and shortlisted bidders will be opened. The date and time of opening of financial bids shall be informed only to the shortlisted bidders.

33.2. IUCAA- reserves the right to accept the offer in full or in parts or reject summarily or partly & cancel the bid without giving any reason.

34. Bidder's capability to perform the contract:

34.1. IUCAA, through the above process of tender scrutiny and tender evaluation will determine to its satisfaction whether the bidder, whose tender has been determined as the lowest evaluated responsive tender is eligible, qualified and capable in all respects to perform the contract satisfactorily.

34.2. The above-mentioned determination will, inter alia, consider the bidder's financial, professional capabilities for satisfying all the requirements of IUCAA as incorporated in the tender document. Such determination will be based upon scrutiny and examination of all relevant data and details & supporting document submitted by the bidder in its tender as well as such other allied information as deemed appropriate by IUCAA.

35. **Notification of Award:** IUCAA will notify the successful bidder that its tender for SITC of DG Set has been accepted. The notification of award shall constitute the conclusion of the contract. IUCAA will inform the successful bidder in due course by e-mail.

36. **Issue of Contract:** After notification of award, IUCAA will send the duly executed contract/work order to the successful bidder by email/registered/speed post etc. The successful bidder shall return a copy of the order, duly executed and dated, to IUCAA in person / by registered / speed post / courier within fifteen days of receipt of the same from IUCAA, failing which IUCAA may treat the contract to be repudiated.

37. **Taxes and Duties, Fees etc.:** Bidder shall be entirely responsible for payment of all taxes, duties, fees, levies, applicable cess etc. during the contract period.

38. **ESI, PF & other regulatory rules & laws:** Agency has to cover his workers & staff under ESI & PF scheme and comply with local laws & statutes dealing with employment of persons

necessary reports to be submitted.

39. **Security Deposit (SD)**: SD will be 5 % of the accepted tender value. EMD will be converted in to the SD and balance amount of SD will be recovered from first two RA bill in equal installments. Security Deposit will be refunded to the vendor on completion of all contractual obligations including the Defect Liability Period + 60 days.
40. **Performance Guarantee / Performance Bank Guarantee**: Within 30 days from the date of receipt of letter of intent/Work Order, the successful bidder shall submit a Performance Security for 3% amount of the accepted contract value. The PG shall be paid through NEFT/RTGS/PBG. Photo copy of transaction ID or UTR no. must be provided. In the event of any amendment issued to the contract, the bidder shall, within 30 days of issue of the amendment, furnish the performance guarantee of the corresponding amendment value, rendering the same valid in all respects in terms of the contract, as amended. If bidder fails to submit balance performance guarantee amount within 30 days, from the date of award of Contract / Work Order / Amendment, there shall be a penalty of Rs. 5000/- per day (Rupees Five thousand only per day) up to a maximum of 5% of the WO/Contract value.
- 40.1. Subject to above, IUCAA will release the performance guarantee without any interest to the bidder after satisfactory completion of work.
- 40.2. Failure of the successful bidder in providing performance guarantee and/ or returning contract copy duly signed in terms of GCC above shall make the bidder liable for forfeiture of its EMD and, also, for further actions by IUCAA against it.
- 40.3. If the bidder furnishes Performance Bank Guarantee to IUCAA for an amount equal to three per cent (3%) of the total value of the contract valid up to contract period (satisfactory completion of work), then the amount of Performance Guarantee will be refunded. Performance Bank Guarantee must be issued by a **Nationalized Bank** in India and in the prescribed form.
- 40.4. In the event of any loss due to bidder's failure to fulfill its obligations in terms of the contract, the amount of the performance guarantee shall be payable to IUCAA to compensate for the same. IUCAA shall have the right to deduct full or part of the performance guarantee and shall refund the balance amount, if any, to the Agency on the termination/completion of the term of the Contract.
41. **Payment**:
- 41.1. The payment will be made as per the exact measurement basis.
- 41.2. The minimum running (R.A) certified bill value shall be of minimum Rs 30/- Lakhs. In order to facilitate the speed of works IUCAA will offer 75% Adhoc payment on assessed RA bill from the bidder. The advance will be adjusted against final certification of RA bill. The final bill payment will be made within 30 days after satisfactory completion of the work. All payments shall be made through RTGS/NEFT/LC.
- 41.3. 70% advance payment will be made on the approved material received at the site and after inspection of the material by the Engineer-in-Charge of IUCAA.
- 41.4. GST will be paid as per prevailing rates, TDS & other taxes will be recovered as per prevailing rates of Income tax act.
- 41.5. Payment of Wages and other conditions of employment of workers should be not inferior to as stipulated in the Minimum Wages Act. All formalities and procedures prescribed under the Contract Labour Act, Minimum Wages Act and other related acts should be strictly adhered to IUCAA's responsibility as Principle Employer should be fully protected. The necessary legal registers, forms, returns, and liaison with local (concerned authorities) etc. required as per the law of the land are to be maintained by the Agency and should be made available for inspection by the Inter-

University Centre for Astronomy and Astrophysics at any time. The Agency will have its workers covered under ESI, PF and other Acts as applicable from time to time at its own cost.

42. **Termination and Penalty/Liquidated Damage (LD):** It shall be the primary responsibility of the bidder that work contract is executed as per terms and conditions stipulated under this contract to the complete satisfaction of IUCAA. If the completion of project is delayed beyond stipulated time period, then the penalty shall be applicable at the rate of 0.5% per week of incomplete project cost, up-to maximum of 5% of the work order value. In extreme cases, IUCAA may issue show cause notice to Agency giving 15 (fifteen) days for improvement, failing which the work contract shall be liable to be terminated along with forfeiture of the performance guarantee. Decision of IUCAA in this regard shall be treated as final and binding on the Agency. If the Agency refuses to carry out the work under this contract at any stage before the expiry of the period of contract, the work contract shall be liable to be terminated by IUCAA without giving any notice along with forfeiture of the performance guarantee. In such situations IUCAA may get the work done from any other person/firm at the risk and cost of the Agency till new contract is awarded or 60 days period whichever is earlier. An expenditure so incurred by IUCAA shall be deducted from the payments due to the Agency.

42.1. **Termination for insolvency:** If the bidder is declared by any competent authority/court as bankrupt or otherwise insolvent, the contract shall be deemed to be terminated from the date of such declaration however, such termination will not prejudice or affect the rights and remedies which have accrued and / or will accrue thereafter to IUCAA.

42.2. **Termination for convenience:** IUCAA reserves the right to terminate the contract, in whole or in part, by serving written notice to the bidder at any time during the currency of the contract. The notice shall specify that the termination is for the convenience of IUCAA. The notice shall also indicate inter alia, the extent to which the bidder's performance under the contract is terminated, and the date with effect from which such termination will become effective.

The goods and services which are complete and ready in terms of the contract for delivery and performance within thirty days after the bidder's receipt of the notice of termination may be accepted by IUCAA following the contract terms, conditions and prices. For the remaining goods and services, IUCAA may decide:

- i. to get any portion of the balance completed and delivered at the contract terms, conditions and prices; and / or
- ii. to cancel the remaining portion of the goods and services and compensate the bidder by paying an agreed amount for the cost incurred by the bidder towards the remaining portion of the goods and services.

42.3. IUCAA, reserves the right to terminate the said contract at any time on the ground of ineffective services rendered by the agency. IUCAA will be the sole judge to determine the facts.

43. **Force Majeure:** Notwithstanding the provisions contained in tender document clauses, the bidder shall not be liable for imposition of any such sanction so long the delay and/or failure of the bidder in fulfilling its obligations under the contract is the result of an event of force majeure.

43.1. For purposes of this clause, force majeure means an event beyond the control of the bidder and not involving the bidder's fault or negligence and which is not foreseeable. Such events may include, but are not restricted to, acts of IUCAA either in its sovereign

or contractual capacity, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, and freight embargoes.

43.2. If a force majeure situation arises, the bidder shall promptly notify IUCAA in writing of such conditions and the cause thereof within twenty-one days of occurrence of such event. Unless otherwise directed by IUCAA in writing, the bidder shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

43.3. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of force majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side.

43.4. In case due to a force majeure event IUCAA is unable to fulfill its contractual commitment and responsibility, IUCAA will notify the bidder accordingly and subsequent actions taken on similar lines described in above sub-paragraphs.

44. Settlement of Disputes:

44.1. Any dispute arising out of the terms of this contract or in the interpretation of any clause herein shall be settled by mutual discussion between the nominated authorities of IUCAA and the Agency or their authorized representatives. The Director of IUCAA will be the final authority in resolving such disputes.

44.2. In the event of a dispute or difference which cannot be resolved by mediation, the same shall be referred to an Arbitration Tribunal consisting of three members. Either party shall give notice to the other regarding its decision to refer the matter to arbitration. Within 30 days of such notice, one Arbitrator shall be nominated by each party and the Umpire Arbitrator shall be nominated by agreement between the parties to this agreement. The venue of the arbitration will be Pune. Subject to the aforesaid, the Arbitration and Conciliation Act, 1996 with amendments and the rules there under and any statutory modification thereof for the time being in force shall apply to the Arbitration proceedings.

45. **Governing language:** The contract shall be written in English language following the provision as contained in tender document. All correspondence and other documents pertaining to the contract, which the parties exchange, shall also be written accordingly in English language.

46. **Applicable Law:** The contract shall be interpreted in accordance with the laws of India.

47. **Contacting IUCAA Authorities:** No bidder shall contact any of the IUCAA authorities on any matter relating to their bid, from the time of the opening of the bids to the time the contract is awarded.

48. **Committee Duly Constituted by IUCAA Reserves the Right to Accept any Bid and to Reject Any or All Bids:** A committee duly constituted by IUCAA reserves the right to reject, accept or prefer any bid and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the ground for its actions and decisions. IUCAA also reserves the right to accept any bid in part or split the contract between two or more bidders.

49. **Eligibility of bidders from specified countries:** Orders issued by the Government of India restricting procurement from bidders from certain countries that share a land border with India shall apply to this procurement.

(1) Any bidder from a country that shares a land border with India

(<https://mea.gov.in/india-and-neighbours.htm>), excluding countries as listed on the website of the Ministry of External Affairs (<http://meadashboard.gov.in/indicators/92>), to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects (hereinafter called 'Restricted Countries') shall be eligible to bid in this tender only if Bidder is registered (<https://dipp.gov.in/sites/default/files/Revised-Application-Format-for-Registration-of-Bidders-15Oct2020.pdf>) with the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). Bidders shall enclose the certificate in this regard from appropriate Government of India authority.

In Bids for Turnkey contracts, including Works contracts, the successful bidder shall not be allowed to sub-contract works to any bidder from such Restricted Countries unless such bidder is similarly registered.

If Bidder has proposed to sub-contract Services or incidental Goods directly/ indirectly from the vendors from such countries, such bidder/vendor shall be required to be registered with the Competent Authority. However, if Bidder procures raw material, components, and sub-assemblies from such countries' vendors, such vendors shall not require registration.

"Bidder from such Restricted Countries" means: -

- (i) An entity incorporated, established, or registered in such a country; or
- (ii) A subsidiary of an entity incorporated, established, or registered in such a country; or
- (iii) An entity substantially controlled through entities incorporated, established, or registered in such a country; or
- (iv) An entity whose beneficial owner is situated in such a country; or
- (v) An Indian (or other) agent of such an entity; or
- (vi) A natural person who is a citizen of such a country; or
- (vii) A consortium/ joint venture where any member falls under any of the above

(2) The beneficial owner shall mean:

- (a) In a company or Limited Liability Partnership, the beneficial owner is the natural person(s). Whether acting alone or together or through one or more juridical persons, controlling ownership interest or exercises control through other means.

Explanation-

"Controlling ownership interest" means ownership of or entitlement to more than twenty- five percent of the company's shares or capital or profits.

"Control" shall include the right to appoint a majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholder agreements or voting agreements;

- (b) In the case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together or through one or more juridical persons, has ownership of entitlement to more than fifteen percent of capital or profits.
- (c) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
- (d) Where no natural person is identified under (a) or (b) or (c) above, the beneficial

owner is the relevant natural person who holds the position of senior managing official.

- (e) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

50. **Public Procurement (Preference to Make in India), Order 2017:** This Institute is following and abide with the Public Procurement (Preference to Make in India), Order 2017, DIPP, MoCI Order No. P-45021/2/2017-B.E.II dated 15th June 2017 and subsequent amendments to the order. Accordingly, preference will be given to the Make in India products while evaluating the bids, subject to technically qualifying & meeting the Institute's technical requirements. However, it is the sole responsibility of the bidder(s) to specify the product quoted by them is of Make in India product along with respective documentary evidence as stipulated in the aforesaid order and the quality as mentioned in the tender in the technical bid itself.

a) IUCAA Pune shall compare all substantially responsive bids to determine the lowest valued bid. This Institute is following and abide with the Public Procurement (Preference to Make in India), Order 2017, DIPP, MoCI Order No. P45021/2/2017-B.E.II dated 15th June 2017 and its subsequent amendments. Accordingly, preference will be given to the Make in India products while evaluating the bids, however, it is the sole responsibility of the bidder(s) to specify the product quoted by them is of Make in India product along with respective documentary evidence as stipulated in the aforesaid order in the technical bid itself.

b) As per the above order and its subsequent amendments "Local Content" means the amount of value added in India which shall be value of the item procured (excluding net domestic indirect taxes) minus the value of the imported content in the item (including all the custom duties) as a proportion of the total value, in percent. Accordingly, the suppliers will be classified in following categories.

i. Class I local Supplier - has local content equal to more than 50%

ii. Class II local Supplier - has local content more than 20% but less than 50%

c) **Verification of Local Content:** The Class I Local Supplier /Class II Local Supplier/Non-Local Supplier at the time of bidding shall be required to indicate the percentage of local content and provide self-certification that the items offered meet the local content requirement. The details of the location(s) at which the local value addition is made also needs to be specified.

d) **Procedure for Purchase Preference to 'Class-I local supplier' in procurement of goods or works which are divisible in nature: NOT APPLICABLE FOR THE SUBJECT TENDER**

i) Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract for full quantity will be awarded to L1.

ii) If L1 bid is not a 'Class-I local supplier', 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price for the remaining 50% quantity subject to the Class-I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.

iii) In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier'

within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly.

- iv) In case some quantity is still left uncovered on Class-I local suppliers, then such balance quantity may also be ordered on the L1 bidder.
- e) **Procedure for Purchase Preference to 'Class-I local supplier' in procurement of goods or works which are not divisible in nature and in procurement of goods/services/works where the bid is evaluated on price alone: APPLICABLE FOR THE SUBJECT TENDER**
 - i) Among all qualified bids, the lowest bid will be termed as L-1. If L-1 is 'Class-I local supplier', the contract will be awarded to L1.
 - ii) If L-1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L-1 price.
 - iii) In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly.
 - iv) In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.

In case of procurement in excess of Rs.10 crores, the suppliers shall be required to provide the certificate from the statutory auditor or cost auditor of the company giving the percentage of local content.

Note: In case a complaint is received by the procuring agency or the concerned Ministry/Department against the claim of a bidder regarding local content/ domestic value addition in an electronic product, the same shall be referred to STQC.

Any complaint referred to IUCAA PUNE shall be disposed of within 4 weeks. The bidder shall be required to furnish the necessary documentation in support of the domestic value addition claimed in an electronic product to IUCAA PUNE. If no information is furnished by the bidder, such laboratories may take further necessary action, to establish the bonfires of the claim.

A complaint fee of Rs.2 Lakh or 1% of the value of the domestically manufactured electronic products being procured (subject to a maximum of Rs. 5 Lakh), whichever is higher, to be paid by Demand Draft to be deposited with IUCAA PUNE. In case, the complaint is found to be incorrect, the complaint fee shall be forfeited. In case, the complaint is upheld and found to be substantially correct, deposited fee of the complainant would be refunded without any interest.

False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law. The bidders can be debarred for a period up to two years as, per Rule 151(iii) of GFR 2017, in case of false declaration.

SECTION-III

GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF BIDDERS

ITEM RATE TENDER AND CONTRACT FOR WORKS

Name of Work: "SITC of 650 KVA DG SET at IUCAA Pune."

GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF BIDDERS

1. All works proposed to be executed by contract shall be notified in a B-2 (Item rate) form of invitation to tender pasted on a board hussng up in the office IUCAA, Pune - 7. This form will state the work to be carried out as well as the date for submitting and opening tenders, and the time allowed for carrying out the work, also the amount of the EMD to be deposited with the tender and the amount of security deposit to be deposited by the successful tenderer, and the percentage, if any, to be deducted from bills. It will also state whether a refund of a quarry fees, royalties, dues and ground rents will be granted. Copies of the specifications, designs and drawings, estimated rates, scheduled rates and any other documents required in connection with the work shall be signed by the IUCAA for the purpose of identification and shall also be open for inspection to bidders at the office of the Estate Manager office during office hours. Where the works are proposed to be executed according to the specifications recommended to a bidder and approved by a competent authority on behalf of the IUCAA, Pune such specifications with designs and drawings shall form part of the accepted tender.
2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof, and in the event of the absence of any partner, it shall be signed his behalf by a person holding a **power of attorney** authorizing him to do so.
3. The IUCAA authority competent to dispose of the tender shall have the right of rejecting all or any of the tender.
4. No receipt for any payment, alleged to have been made by a bidder in regard to any matter relating to his tender or the contract, shall be valid and binding on IUCAA of Pune unless it is signed by the Estate Manager.
5. All works shall be measured net by standard measures and according to the rules and customs of the Public Works Department and their rates shall be without references to any local custom.
6. Under no circumstances shall any bidder be entitled to claim enhanced rates for any items in this contract.
7. All corrections and additions or pasted slips should be initialed.
8. The measurements of work will be taken according to the usual methods as in use in P.W.D. Red Book/IS Codes and no proposals to adopt alternative methods will be accepted. The Engineer-in-charge decision as to what is the usual method in use in the Department will be final.

9. Successful tenderer will have to produce PAN-Card, GST certificate issued by Income Tax Department otherwise their R.A. Bills will not be paid by the IUCAA, Pune.
10. The bidder will have to construct shade for storing controlled and valuable materials brought by the bidder at the work site, having double locking arrangements at bidder's cost. The materials will be taken for use in the presence of the departmental person. No material will be allowed to be removed from the site of works.
11. The bidder will have to make his own security arrangement for the protection of material and the equipment. The owner security arrangement for the protection of material and the equipment. The owner /IUCAA will be not responsible for any theft.
12. Tap off's for temporary water and electricity shall be provided on site at single source (free of cost). The Bidder shall make its own arrangement thereafter from the Tap off's for Works and all costs in relation thereto shall be borne solely by the Bidder.

QUALITY ASSURANCE AND MAINTENANCE

To ensure the specified quality of work which shall also include necessary surveys, temporary works etc., and the bidder shall prepare a quality assurance plan and get the same approved from the **Engineer-in-charge** within eight days from the date of work order. For this, bidder shall submit an organization chart of his technical personnel to be deployed on the work along with their qualification, job descriptions defining the functions of reporting, supervising inspecting and approving. The bidder shall also submit a list of tools, equipment's and the machinery and instrumentation which he proposes to use for the SITC of DG Set and for testing in the field and/or in the laboratory and monitoring. The bidder shall modify/supplement the organization chart and the list of machinery, equipment etc. as per the direction of the Engineer-in-charge and shall deploy the personnel and equipment on the field as per the approved chart and list respectively. The bidder shall submit written method statements detailing his exact proposals of execution of the work in accordance with the specifications. He shall get these approved from the **Engineer-in-charge**. The quality of the work shall be properly documented through certificates, records, check-lists and logbooks of results etc. Such records shall be compiled from the beginning of the work and be continuously updated and supplemented and this shall be the responsibility of the bidder. The bidder shall prepare detailed completion shop/GA drawings. He shall also prepare and submit a maintenance manual giving procedure for maintenance, with the period of maintenance works including inspections, tools and equipment to be used, means of accessibility for all parts of the structure. He shall also include in the manual, the specifications for maintenance work that would be appropriate for his design and technique of SITC of DG Set. This manual shall be submitted within the contract period.

TECHNICAL SPECIFICATIONS OF 650 KVA DG SET

1. INTENT OF SPECIFICATION:

- 1.1. This specification covers the design, manufacture, assembly, shop testing, packing, dispatch, transportation, supply, erection, testing, commissioning, performance and guarantee testing of Silent Diesel Generating Set, complete in all respects with all

equipment, fitting and accessories for efficient and trouble-free operation as specified here under including statutory approvals as per prevailing norms/rules.

1.2. **SCOPE OF WORK:** General Scope of work shall include design, manufacture, shop testing, packing, dispatch, transportation to site, supply, erection, testing and commissioning of the following:

- a) Diesel engine complete with all accessories, an Alternator directly coupled to the engine through flexible/ rigid coupling complete with all CTs, PTs, etc. as required or as per BOQ & technical specifications, accessories for starting, regulation and control, including base frame, foundation bolts etc, interconnecting piping and accessories, power and control cables, glands and lugs.
- b) Control panel cabling between bidder's DG Set & synchronisation panel/controller, local equipment and special power/control cables required if any.
- c) Equipments necessary for fuel storing and distribution, day fuel tank, piping, valves, level controller and indicators etc. with total responsibility of load sharing and load management facility with Synchronization Panel.
- d) Flexible connections and Residential Grade Silencer of exhaust system, including thermal lagging inside canopy with bird cap suitably optimized to meet stringent noise limit silencer specifically tuned to EATS.
- e) Batteries with MS battery stand painted with one coat of Zinc Oxide and two coat of acid proof black paint and battery charging equipment, including their connections as necessary along with tools & accessories for battery maintenance.
- f) Anti Vibration Mountings etc.
- g) Preparing of all related shop drawings for approval from client/consultant and PWD, statutory bodies. Work shall be as per Final approved drawings
- h) Obtaining approval/licencing of the installation of Diesel Generators by the PWD, Electrical Inspectorate and Pollution Control bodies and any other statutory bodies. Any other registrations of Genset (eg. Industry department)
- i) Carrying out performance and guarantee test i.e. full load test for 6 hrs followed by 1 hour 110% over load and again 6 hrs full load (Total 13 hours). Bidder has to make arrangements for oil lubricants, DEF, HSD, other consumables and Electrical load of 110% capacity etc. as required
- j) The DG set shall be mounted on a suitable designed fabricated rigid common base frame with antivibration pads to provide not less than 99% vibration isolation. First filling of lube oil, radiator coolant, DEF & HSD shall be included in DG - sets cost. The DG Set shall include all standard accessories, fittings, instruments and 3 sets of operating & maintenance manuals, spare parts list etc. complete as per technical specifications. The DG set shall be inclusive of AMF controller, Fuel day tank, Residential Grade Silencer of exhaust system, including thermal lagging inside canopy with bird cap/net suitably optimized to meet stringent noise limit

silencer specifically tuned to EATS etc. complete as required.

- k) The DG Sets shall be subjected to load tests at factory before dispatch & at IUCAA site after installation in the presence of IUCAA's representative with consultant. All consumables required during testing of DG Sets at factory & site testing shall be included in the scope of DG bidder. All consumables required during trial run of DG Sets on load for 13 hours out of which six hours for run up to full load, followed by six hours on part load and concluded by one hour 110% overload capacity to be arranged by DG Bidder. Also, Bidder has to arrange the 110% of rated capacity load bank availability for testing at factory and at IUCAA site. The test shall be carried out as per Technical Specification & records to be submitted for approval. (The formats of all tests carried out at factory & at site with details of relevant standards as per latest standards & permissible limits should be submitted by DG bidder for reference along with tender).
- l) **The design of DG Sets shall conform to the requirement of CPCB IV+ norms (CPCB IV+ Emission Compliant) for all parameters including flue gas emission and noise level.** DG set should be provided with standard accessories like anti vibration pads, AVR, electronics Class G3 governor, breaker, MFM, microprocessor-based controller (latest version), control cables, power cables complete as required up to AMF panel. BMS compatible ports & I/Os.
- m) It shall be the responsibility of the bidder to obtain statutory clearance from the authorities like PWD, SEB, CPCB, Electrical Inspector etc. for installation and commissioning of the above DG Set as per prevailing norms/rules. The bidder shall prepare the necessary documents/drawings and submit it to IUCAA for approval before submitting it to the PWD/SEB/CPCB authorities. Please note that any statutory payment to PWD/SEB/CPCB department should be made by the bidder separately. On submission of the original payment receipt in the name of 'IUCAA', the same amount will be refunded.

BMS Requirement:

DG Bidder to specify the BMS system architecture shall be able to satisfy the client's requirement. Following are some of requirement listed for guidance but not limited to:

- 1) RS 485 / Backnet Output from each DG set for BMS.
- 2) Analog input along with monitor points for fuel level, generated voltage, current, engine temperature, Battery voltage, charging current, frequency & over speed, RPM, coolant temperature, oil temperature etc.
- 3) Potential free contacts from each DG set breaker for BMS for ON/OFF/Trip status
- 4) BMS Controller with 5 Universal Inputs and 5 Binary Outputs in MS Enclosure with required power supply, connectors, internal wiring etc.
- 5) Convertor with 2 inputs and 1 RS 232/485 output, cabling etc.

GENERATOR STANDARD FEATURES:

- 1) Bidder to provide one-source responsibility for the generating system and accessories.
- 2) The generator set and its components are prototype-tested, factory-built, and production-

tested.

- 3) Three years warranty covers all DG Set systems and components along with synchronisation with existing DG Set.
- 4) Industrial diesel engine with 24 Volt battery charging alternator.
- 5) Rated capacity Alternator with insulation class H & IP 23 protection.
- 6) Unit-mounted radiator.
- 7) Subbase fuel tank – Not less than 990 litres. capacity with float type level indicator, seven segment digital fuel level indicator.
- 8) To easily monitor fuel levels, manual fuel level gauges must be provided inside and outside the acoustic canopy.
- 9) A fuel extension plug must be provided outside the acoustic canopy near the manual fuel gauge to connect the fuel tank with MS piping.
- 10) Four LED light fittings with switch must be provided in the DG Set acoustic canopy
- 11) Vibration isolators.
- 12) Dry type air filter with restriction indicator.
- 13) A Fuel Water separator must be provided.
- 14) DEF AUS32 (premix) as per ISO22241.
- 15) Main line mccb/ACB.
- 16) Starting battery and cables.
- 17) Sound enclosure with 75dB(A) at 1 meter
- 18) Conveniently locate fuel level indication.
- 19) Operation and installation literature.

ADVANCED DIGITAL CONTROLLER of DG SET :

Compact Controller comprising of: 7/9 configurable analogue/digital inputs, fully configurable via PC/Laptop using USB, RS485 communication, user friendly interface and backlight full graphics LCD display for measurement of –

- 1) Engine Running hours
- 2) Current R, Y, B
- 3) Voltage Phase to Phase & Phase to Neutral
- 4) Frequency & PF
- 5) Engine temperature & Oil Pressure
- 6) Engine speed (RPM)
- 7) Battery Voltage
- 8) Fuel level
- 9) Routine maintenance indicator
- 10) Power save mode
- 11) Generator KVA, KW, KVAR
- 12) Cumulative power consumption in Kwh, KVAh, KVARh
- 13) Event log with date & time

LCD display faults:

- 1) High engine temperature
- 2) Low oil pressure
- 3) Over crank
- 4) Overspeed
- 5) Over & under voltage
- 6) Over & under frequency

- 7) E-stop
- 8) Auxiliary fault
- 9) Display warning:
- 10) Low/High battery voltage
- 11) High battery voltage
- 12) Low fuel level
- 13) Fuel Theft

STANDARD FEATURES & ACCESSORIES:

- 1) Master switch: Run/Off-Reset/Auto
- 2) Current selector switch
- 3) Remote two-wire start/stop capability
- 4) Event log with latest 100 events
- 5) CANbus engine interface for communication
- 6) Factory-built and production-tested
- 7) Automatic start with programmed cranking cycle
- 8) Field software upgrade possibility
- 9) Environmental specifications:
 - i) Operating temperature : -20°C to 65°C
 - ii) Humidity : 0--95% condensing
- 10) Power Requirements:
 - 24 VDC with fuse protection
 - 250 mA @ 24 VDC
 - 125 mA @ 24 VDC
- 11) Battery charger 24V
- 12) Mains sensing relay
- 13) Earth leakage protection
- 14) IP65 protection
- 15) CE Complaint & UL recognised

Important Notes:

- 1) DG Set should accept 55% load of rated capacity of DG Set in one step at the time of starting.
- 2) DG Set's panel shall be suitable for Auto operation controlled through AMF Relay as well as manual operation.
- 3) DG Set supplier shall provide microprocessor-based DG's Local Control panel mounted on the engine having all electrical parameters and fault indication with provision for its remote control.
- 4) DG Supplier should provide for all required hardware (convertor to give BACnet compatibility, control wiring, potential free NO/NC, RS ports, A/D & D/A converters etc. as required to operate the BMS system software.) arrangement for remote start/stop and DG fault (LLOP, over speed) etc. along with remote adjustment of voltage & speed of the engine (Motorised/ solid state pot. may be required) & shall be included in the quoted rates as required.
- 5) A cable thick terminal box (made of 3 mm thick CRCA sheet with powder coated) must be provided above the DG set alternator to connect/terminate power cables (4Rx3.5 CoreX300 Sq. mm Aluminum Armoured Cable) with proper mounting arrangement.
- 6) The neutral CTs as per specification shall be provided on the neutral side of winding and connection brought out to a neutral CT box to be mounted on the alternators (All the six terminals are to be brought out and then shorted).

- 7) Supply, installation, testing & commissioning of Residential Grade Silencer of exhaust system, including thermal lagging inside canopy with rain cap suitably optimized to meet stringent noise limit silencer specifically tuned to EATS **as per CPCB IV+ norms** with 100mm mineral /rockwool insulation complete with wire chicken mesh and 22 gauge Aluminium cladding from engine up to silencer, including supporting arrangement suitable for the following DG Set complete as required.
- 8) Supply, fabrication, installation, testing & commissioning of M.S. day fuel tank fabricated out of minimum 2.5 mm thick M.S. sheet installed on steel frame or masonry pedestal with all associated accessories, filters, valves & fittings including level controller, priming motor complete as required, float switch with contacts for remote interlock should be provided. The tank shall be suitably treated with diesel resistant paint/anticorrosive treatment. The contact of level controller shall be wired up terminal block. or as per manufacturer's design included in the enclosure. The tank level remote indicator to be provided at some suitable location as advised by client in the canopy.

1.3 CODES AND STANDARDS:

1.3.1 The equipment furnished under this specification shall conform to the following latest standards, except where modified or supplemented by this specification.

: Specification for reciprocating internal combustion engine.

: Rotating electrical machines of particular type or for particular applications.

IS: 1239 (Part-I & II) : Mild steel tubes and fittings.

S/IEC 60034-1: Rotating electrical machines - Part 1: Rating and performance

ISO 1460 - ISO 1460:2020 - Metallic coatings

ISO 8528 - Reciprocating internal combustion engine driven alternating current generating sets

ISO 9001 - international standard that specifies requirements for a quality management system (QMS)

ISO 13018 - Internal Combustion Engines - Method of Test for Pressure Charged Engines

: Stationary cells and batteries lead acid type (with tubular positive plates).

IS: 9224 : Specification of low voltage fuses, General purpose.

: Mono-crystalline semi-conductor rectifier assemblies and equipment.

IS: 4722 : Rotating electrical machines.

IS: 1248 : Specification for electrical indicating instruments.

IS: 10000 : Methods of tests for internal combustion engines.

IS: 10002 : Specifications for performance requirements for constant speed compression ignition (Diesel) engine for general purposes (above 20 KW)

: Degree of protection provided by enclosure for low voltage switchgear and control gear.

: Code for type testing of constant speed IC engines for general purposes.

: Performance of constant speed IC engines for general purposes.

ISO 8178-1: 2017 ISO 8178-1: 2020 - Reciprocating internal combustion engines — Exhaust emission measurement — Part 1: Test-bed measurement systems of gaseous and particulate emission.

ISO 8178-3: 2019 - Exhaust emission measurement — Part 3: Test procedure for measurement of exhaust gas smoke emissions from compression ignition engines using a filter type smoke meter.

ISO 8178-4: 2017 ISO 8178-4: 2020 - Reciprocating internal combustion engines — Exhaust emission measurement — Part 4: Steady-state and transient test cycles for different engine application.

ISO 8178-7: 2015 - Reciprocating internal combustion engine-Exhaust emission measurement-Part-7: Engine family determination.

ISO 8178-9: 2019 - Reciprocating internal combustion engines — Exhaust emission measurement — Part 9: Test cycles and test procedures for measurement of exhaust gas smoke emissions from compression ignition engines using an opacimeter.

40 CFR Part 1039 - US EPA Regulation: 40 CFR Part 1039 - Control of emissions from new and in-use nonroad compression-ignition engines.

40 CFR Part 1065 - US EPA Regulation: 40 CFR Part 1065 – Engine testing procedures.

1.3.2 The installation work shall conform to Indian Electricity act and Indian Electricity Rules as amended upto the date of installation. The fuel oil installation shall meet all statutory requirements of Govt. of India as amended up to the date of installation. Any approval required from statutory authorities shall be obtained by the contractor. Nothing in this specification shall not be the limiting factor to relieve the contractor of their responsibilities.

1.3.3 The equipments furnished under this specification have to operate in a tropical climate and shall be given tropical and fungicidal treatment as per relevant specification.

1.4 ENGINE :

1.4.1 Type :

The diesel engine must be four stroke, six inline cylinders, turbo charged, radiator cooled engine and shall be technologically advanced engine to meet stringent exhaust emission norms as per latest MoEF notification. DG sets must comply with the requirements of CPCB IV+ standards (CPCB IV+ Compliance) for all parameters including flue gas emission and noise level etc.

1.4.2 Rating :

- a) BHP rating of the engine shall be such that the DG set must be prime rating deliver the specified net electrical output while supplying power/driving all electrical and mechanical auxiliaries connected to alternator terminals and engine shaft at specified site conditions and ambient temperature of 50 deg C.
- b) It shall also be capable of satisfactorily driving the alternator at 10% over load at the rated speed for one hour in any period of 12 hours of continuous running.

The successful bidder shall have to furnish supporting calculations to arrive at the diesel engine rating.

1.4.3 Speed and Vibration Level :

Speed shall be 1500 revolutions per minute. Speed governor/over speed protection shall be provided. At due running conditions, speed shall be stabilized at plus or minus 2% nominal speed, regardless of load. At transient condition, engine speed shall vary not more than 10% plus or minus. Governor class must be G3 for normal application unless otherwise specified. The Governor of all DG set shall be of similar characteristics to enable synchronization with existing DG Set. The engine vibration level must be below than 300 microns.

1.4.4 Lubrication :

- a) The engine shall have a closed cycle forced & splash lubricating system with positive oil pressure and a crank chamber for collection/storage of the lubricating oil during circulation. No moving part shall require lubrication by hand or any other external source either prior to the starting of the engine or when it is in operation.
- b) A lubricating oil filter shall be provided for operation under normal conditions for a period of 500 hours without the necessity of its replacement or cleaning.
- c) In case lubricating oil coolers are required they shall be of the water-cooled type and shall be supplied as an integral part of the Diesel Generator Set.
- d) Necessary temperature and pressure gauges and other instruments shall be supplied and fitted on the lubrication system.
- e) A lubricating oil level dipstick suitably graduated shall be provided and located in the accessible position.

1.4.5 Fuel System :

- a) The fuel consumption of the engine at full, 75% and half of its rated power output shall be indicated by the bidder in the bid.
- b) Water Separator must be provided for offered engine to avoid water particles from fuel to ensure smooth functioning of DG Set.
- c) A fuel service tank of capacity as specified in BOQ shall be provided on a suitably fabricated steel platform. The tank shall be complete with level indicator marked in litres, filling inlet with removable screen, an outlet, a drain plug, an air vent and necessary piping. The fuel tank shall be painted with oil resistant paint. Service tank level switches for alarm & trip shall also be provided by the bidder. All pipe joints should be brazed/ welded. Digital Fuel level indicator recommended with clear 7 segment display.
- d) The DG set engine offered by the bidder must be compatible for dual fuel application (i.e. HSD & Natural Gas) to reduce emission and meet green environmental policies.
- e) A hand pump for pumping the fuel into the fuel service tank together with necessary pipes or tubing shall be provided. The inlet of the pump shall be provided with 10 meters long armoured hose with suitable filter & nozzle.

1.4.6 Air Intake System :

The diesel engine shall be provided with special dry type air filters having low resistance to air passage, high dust retaining efficiency and provision for easy cleaning. Filters shall be suitable for achieving satisfactory engine operation and ensuring the engine life under tropical humid conditions, with sulphur dioxide and trioxide fumes, abrasive dust and coal particles to be comply with CPCBIV+ norms present in the atmosphere. The minimum efficiency of filters shall be 90% down to 5 micron size.

1.4.7 Cooling :

The diesel engine should be liquid/fluid cooled.

1.4.8 Engine Governor :

The governor shall be Class G3 type Electronic Governor as per ISO 8528 part V. It shall have necessary characteristics to maintain the speed substantially constant even with sudden variation in load. However, a tripping shall be provided if speed exceeds maximum permissible limit. The governor shall be suitable for operation without external power supply.

1.4.9 Turbo Charger :

It shall be of a robust construction, suitable of being driven by engine exhaust having a common shaft for the turbine and blower. It shall draw air from filter of adequate capacity to suit the requirements of the engine.

1.4.10 Quietness of Operation :

- a) The engine shall be designed to achieve maximum quietness of operation.
- b) Efficient Residential Grade Silencer shall be provided for the exhaust as well as the air intake.
- c) Noise level of the set shall not exceed 75 dB at One meter distance of the DG Set.

1.4.11 Engine Starting :

- a) Engine starting shall be by electric starting motor complete with manual/automatic starting arrangement. The starter motor shall conform to IS-4722 and shall be of adequate power for its prime duty and be of inertia or pre- engaged type. The pinion shall positively disengage when the engine starts up or when the motor is de-energised. The engine cranking shall be only from the panel and any engine starting devices etc, that are given as original fitment on the engine by engine manufacturers shall be either removed or padlocking arrangement given for this so that all normal start/stop operations could be done only from panel whether the set is AMF or manual.

b) Time for Run-up to Speed:

From the initial operation of the starting device, the engine shall start, run up to normal speed and be capable of accepting 80% of full load within a maximum time of 25 seconds, and full load within a further 5 seconds.

c) Duty Cycle / Period of Operation:

The set is intended to supply power only during an emergency for essential services and may be idle for long periods except for periodic routine run once in a day for a short time. When there is a total failure of mains power supply, the sets shall be required to operate continuously at full load for a period which at times may exceed even 18 hours at a stretch. It shall also be capable of satisfactorily running at 10% overload at the rated speed for one hour in any period of 12 hours of continuous running.

i) Starting Duty:

This DG Set shall withstand and shall be able to take care of starting load of largest machine and other running loads (55% of rated capacity).

ii) Running Duty:

This DG Set shall be capable of running continuously on prime duty of about 100% of its name plate rating. Prime power applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528.

1.4.12 Engine Instrumentation:

The following instruments mounted on instrument panel shall be essentially present as minimum, Engine speed tachometer with service hour counter.

- Lube oil pressure gauge

- Lube oil temperature gauge
- Coolant water temperature gauge

The instrument panel shall be mounted on engine using rubber dampers for vibration isolation. The gauge dials shall have clear red marking to identify the limiting dangerous levels, 'Zone markings' on the scale to indicate the normal healthy & abnormal operating zones for the parameters concerned. The metering could be either normal electromechanical analogue type or electronic digital type, latter being preferred as manufacturers fitment only.

1.5 ALTERNATOR:

1.5.1 The alternator shall be PMG brushless type screen protected with revolving field Self-excited alternator conforming to IS/IEC 60034-1 Better motor starting capability and static excitation circuit controlled by field control unit suitably compounded for voltage and load current for a self-excited self-regulated system.

1.5.2 The alternator shall be in Screen Protected Drip Proof (SPDP) IP 23 enclosure, foot mounted with ball and roller bearings on end shields.

1.5.3 The alternator shall conform to IS: 4722 / IS/IEC 60034-1/ BS: 2613 and shall be suitable for tropical conditions.

1.5.4 The alternator shall comply with the following specifications:

Rating	As specified in the B.O.Q
Voltage	415 V
Voltage Regulation (Max.)	±1%
Speed	1500 RPM.
Frequency	- 50 Hz.
P. F.	- 0.8 lag
Waveform distortion/Total Harmonic Distortion - No load	< 1.5%, Non-distorting balanced linear load < 3 %.
Enclosure	IP: 23.
Insulation	'H' grade
Maximum Unbalanced Load across phases	- Less than or equal to 25%
Telephonic Harmonic factor	- < 2%

Excitation - Self excited, self-regulated with brushless system and static voltage control unit suitably compounded for voltage and current to maintain terminal voltage constant at ± 1% at all load for p.f. not less than 0.8. Terminal Box shall be suitable Rating of cable for terminating DG Set cables of rating specified in BOQ with Earthing studs.

1.5.5 Alternator meets IS/IEC 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC600034-1, CSA C22.2-100, AS1359. Superior voltage waveform form a 2/3 pitch wound stator

1.6 DIESEL GENERATOR CONTROL PANEL:

1.6.1 General:

- a) The control panel shall be sheet steel enclosed and shall be dust, weather and vermin proof providing a degree of protection of IP-54 and as per IEC 61439 part 1 and 2 standards. Sheet steel used shall be cold rolled and at least 2.00 mm thick and properly braced and stiffened.
- b) Control panel shall be provided with hidden hinged door(s) with pad locking arrangement and suitable brackets/channels shall be provided for floor mounting.

- c) All doors, removable covers and plates shall be gasketed all around with neoprene gaskets. All accessible live connections shall be shrouded and it shall be possible to change individual switches, fuses, ACBs, MCBs without danger of contact with live metal.
- d) All live parts shall be provided with at least phase to phase and phase to earth clearances in air of 30 mm and 25 mm respectively.
- e) Adequate interior cabling space and suitable removable cable gland plate shall be provided. Necessary number of cable glands shall be supplied and fitted on to this gland plate. Cable glands shall be screwed on type and made of brass.
- f) Two number of earthing terminals shall be provided.
- g) All sheet steel work shall be degreased, pickled, phosphate and then applied with two coats of finishing powder coating both inside and outside of shade Siemens Grey.

1.6.2 Control of Diesel Generating Sets: a) DG Set shall be capable of being controlled independently. Diesel Generator shall be capable of being stopped manually from remote as well as local. However, interlock shall be provided in the DG local control panel to prevent shutting down operations as long as DG Control circuit breaker is closed.

Auto Operation:

Necessary control equipment and system incorporating various function etc. shall be provided to ensure following: -

When mains power is available, the healthiness of this power shall be monitored through a mains voltage monitor. If voltage on the 3 phases are within limits, the monitor will send a closing signal to the mains breaker and mains power will be connected to the load.

If the voltage drops on any phase or on all phases, the monitor shall sense this drop, and if this drop persists for more than a pre-adjusted period of time (say 1 to 60 seconds) a signal is sent to start the DG sets. While at the same time opening the mains supply breaker and disconnecting load from mains as voltage is below acceptable limits.

The Command shall be sent for starting the engine through the starting solenoid. When the engine is healthy, it starts up in a few seconds and the generator develops voltage and when the voltage is developed, this give a signal to the generator breaker/contactors which closes and connects the diesel generator to the load (three DGs get synchronised first). Simultaneously, it sends a signal to de-energise the engine starting circuit and the starter motor is disengaged. The engine protection circuits for high water temperature and low lubricating oil pressure and engine over speed are also energised.

b) Resumption of Supply:

If voltage from mains is resumed, the main voltage monitor will sense this voltage for healthiness, i.e. for maintained correct voltage for a period of time (adjustable upto three minutes) and then send a signal to the panel to stop the engine and to change over the breakers from generator to mains and normal supply is resumed to the load. Provision shall also be made for effecting the changeover to

normal supply through a selector switch.

c) Failure to Start:

A three-attempt starting facility similar to using two impulse timers and a summation timer for engine shall be provided and if voltage fails to develop within 30 seconds from receiving the first start impulse, the set shall lockout automatically and a visual and audible alarm shall be given in the remote panel. The panel shall receive "DG Trouble Alarm" (potential free contacts to be provided).

1.7 ENGINE SAFEGUARDS:

Safeguards shall be provided and arranged when necessary to stop the engine automatically by the following:

- a) Energising a solenoid coupled to the stop lever on the fuel injection pump rack.
- b) Deenergising "fuel on" solenoid or
- c) Energising the "fuel - cut off" solenoid.

The operation of the safeguard shall at the same time give individual warning of the failure by illuminating an appropriate local visual indicator and remote alarm at generator panel.

The contactors, relays and other devices necessary for signal and control, for above purposes shall be provided at Generator panel.

At the set at a easily accessible place an "EMERGENCY STOP" mushroom head stay put type P.B shall be provided to stop the set in emergency mode.

The safe guards to "STOP THE SET" shall stop the set irrespective of mode selection of the set viz Auto, Manual or test for following cases, with simultaneous isolation of alternator circuit.

Emergency stop P.B's operation.

- b) Over speed.
- c) Low lube oil pressure.
- d) Earth fault or restricted earth fault or differential faults of Alternator.

1.8 BATTERY & BATTERY CHARGER:

1.8.1 Starter Battery:

- a) The battery shall conform to the requirement of IS-1651. Starting battery sets of 12 V, heavy duty high performance approved make'/quality shall be provided to enable crank & start the engine even in cold/winter morning conditions. Type/ voltage/AH capacity of same on 20 hour rated discharge period shall be indicated in the offer. The batteries shall be capable of performing at least eight (8) normal starts without recharging. Necessary battery calculations shall be furnished at the time of bid.
- b) The Battery shall be provided with good quality MS stand painted with one coat of Zinc Oxide & two coat of acid proof black paint with min **3 mm thick rubber mat** below the battery.
- c) Batteries shall be of lead container type only and not with PVC moulded sealed container so that each individual cells are available for individual monitoring during its life span. Each cell shall be provided

with electrolyte filling cap with level floats for easy monitoring of electrolytic level.

- d) For each battery system following accessories shall be provided.
1. PVC Funnel - 1 No.
 2. Small PVC mugs with handle - 2 Nos. (Red & white colour)
 3. Hydrometer syringe type with float calibrated (not with zero markings only) with one spare float.
 4. Centre zero voltmeter good quality with 3V-0-3V scale.
 5. PVC jerry-can white colour with tested quality distilled water, with can clearly marked with engraved PVC inscription plate "Distilled Water".
 6. One tin of petroleum jelly (500 gms).
 7. Painter brush 1" wide - 2 nos.
 8. Hand Fuel Pump - 01 No.
- e) The battery shall be provided with 2 nos. cables, min 1.5 m long heavy duty rubber/PVC insulated cabling with brazed tinned lug at one end and with brazed tinned brass terminal lug at battery end - for connecting batteries to cranking system - with 0.5 m long inter battery connecting cable.
- f) The lugs shall be clearly stamped + or - and positive cable also red sleeved for easy identification.
- g) The batteries shall be supplied fully filled and charged ready to use.

1.8.2 Battery Charging System:

- a) Float rate charging and quick rate charging system shall be provided at the generator panel with appropriate bridge charger system, LC network, rate selector switch and generously rated charging transformer and silicon one rectifier bridge, so that the cranking battery system can be kept fully charged at all times from E.B. supply network with quick charging rate limited to 0.8 times rated discharge current with provision in control transformer and Silicon rectifier present to enable boost charging the battery at 2 times rated discharge current in case of emergencies. To this and in the mode selector switch boost charge position shall be present which however shall be kept disconnected at mode selector switch normally.
- b) Two DC ammeters to clearly indicate float charging current and quick/boost charging current shall be provided with 0-250 or 0-500 mA range and 15-0-15 or 30-0-30 A range respectively.
- c) The float charging ammeter circuit logic shall be so as to bring in circuit only on demand through a P.B. the R.S.S. (Rate selector switch) in it float charging mode to prevent damage to the ammeter.
- d) Dropper resistor network on the load side of battery charger system shall be provided so that higher charger voltages in quick or boost conditions does not get impressed on the I/L and contactor coils, which voltage shall remain well within +10% of rated voltage.
- e) Battery charging subsystem shall be designed for continuous operation at cubicle ambient of 55 deg C corresponding to 45 deg C ambient outside and should be designed to operate at 1.5 times rated maximum current corresponding to boost charge current which can reach in practice as high as 2.5 times or 3 times rated discharge current.
- f) Any charger dynamo and dynamo charging current network present on the set shall either have to be

removed or made in operative so that both for AMF and manual application the cranking battery system is kept charged from the charger at the panels at all times during or shut down periods of the set.

1.9 ENGINE EXHAUST :

The exhaust of DG set shall be routed through the Residential Grade Silencer of exhaust system, including thermal lagging inside canopy with rain cap suitably optimized to meet stringent noise limit silencer specifically tuned to EATS **as per CPCB IV+ norms**. It is desired to insulate the exhaust duct/chimney with insulation & appropriate support arrangement & adequate trap door with feasibility of cleaning.

1.10 SPARE PARTS :

1.10.1 Mandatory Spare Parts :

The bidder must provide the mandatory spares and consumables required for 'B' check maintenance for the period of 3 years of the offered 650 KVA DG set.

1.11 TESTS :

1.11.1 The alternator of each type and rating shall be type tested for the all tests as per IS:4722, IEEE 115 & BS:5000. Required type test certificates shall be furnished for information.

1.11.2 The alternators and the starting motors shall be tested for the routine tests as per IS:4722 and test certificates submitted for acceptance.

1.11.3 The control panels shall be tested/checked for following (but not limited to).

- a) Compliance to drawing, data sheet and this specification.
- b) Check for workmanship, wiring, conformity to functional requirements.
- c) Calibration of instruments, meters C.T., P.T. etc.
- d) H.V. Test
- e) I.R. Test before and after HV test.

1.11.4 The acceptance and routine tests of battery shall be done as per relevant standard.

1.11.5 Battery Charger (as per IS: 4540)

- a) All routine tests as per relevant IS.
- b) Test for ripple factor & regulation
- c) Heat run test (as type test)
- d) Operational and functional tests.

1.13 NEUTRAL POINT: The winding of the alternator for 650 KVA shall be star-connected and neutral side leads shall be brought out to a separate terminal box.

1.14 ERECTION, TESTING, COMMISSIONING, PERFORMANCE & GUARANTEE TESTS / PROCEDURE AT SITE:

Client shall provide space for genset and its equipments. Before commencing the erection/installation work on site, the bidder should prepare the following drawings in six sets and submit them to the Engineer-in-Charge for approval -

- i. Equipment Layout drawing.
- ii. Foundation drawing of DG Set and supervise the foundation casting by another agency to ensure its corrections.
- iii. Bus ducting/Power cable, control cable and earth layout drawing.
- iv. Single line diagram.
- v. AMF Panel details.
- vi. Genset and controller wiring diagram
- vii. Canopy design with frame work details.

The entire work of erection, testing and commissioning of equipment supplied under this package shall be carried out by bidder and performance and guarantee tests to be conducted at site are also included under the scope of this specification. For this purpose, the bidder shall depute suitable qualified technical supervisor to site on advance intimation to the IUCAA along with all special testing equipment required for testing and performance and guarantee tests. The supervisor shall be responsible for the installation, testing, commissioning checks and performance & guarantee tests mentioned in relevant clauses of this volume and the checks recommended by the IUCAA.

The successful bidder shall submit sufficiently in advance the bio-data of the supervisor giving details of his experience for IUCAA's approval.

The bidder shall ensure that the equipments supplied by him are installed in a neat workman like manner such that they are levelled, properly aligned and well oriented. The tolerances shall be established in bidder's drawings and/or as stipulated by the Owner. The canopy of the Genset shall be strong and Waterproof (extra coating of any if required, has to specify while bidding)

All special tools and tackles and spares required for erection, testing and commissioning of equipment shall be supplied by the contractor. The bid shall include a list of these special tools, tackles and spares along with their item wise prices. The total cost for these tools, tackles and spares shall be included in the bid price.

Erection, testing and commissioning manuals and procedures shall be supplied, prior to dispatch of the DG Set/ equipment.

The contractor shall ensure that the drawings, instruction and recommendations are correctly followed while handling, setting, testing and commissioning the DG Set/equipment.

1.14.1 Commissioning Check Tests/Performance and Guarantee Test :

In addition to the checks and test recommended by the manufacturer, the bidder shall supervise the following acceptance tests to be carried out on each set.

Load Test:

The engine shall be given test run for a period of at least 13 hours depending upon the actual power factor of the load and set shall be subjected to the maximum achievable load without exceeding the engine or alternator capacity.

This full load test is to be followed immediately by a 10% overload run for one hour. The performance of the engine, alternator and exciter shall be satisfactory at the end of this overload run. All the arrangements of factory visit of IUCAA engineers & consultant - four engineers including stay-if required, shall be in the scope of DG set bidder. At the end of the full-load run, and again at the end of the over-load run, tests for temperature rise and insulation resistance of the alternator as specified shall be taken.

During the load test half hourly records of the following shall be taken:

- a) Ambient temperature
- b) Exhaust temperature.
- c) Lubricating oil temperature.
- d) Lubricating oil pressure
- e) Speed
- f) Voltage, Kva, % Load, wattage and current output.
- g) Oil tank level
- h) Fuel tank level
- i) Radiator Coolant temperature
- j) Frequency and RPM
- k) Engine vibrations

Regulation Test :

The automatic and manual regulation of the alternator load at half and full rated load shall be tested for a nominal volt of 240 volts, between phase to neutral and at 0.8 p.f. to verify the requirements of voltage and frequency variation as per IS:4722.

Speed and Governing:

The speed of the engine shall be verified to ensure that it conforms to the requirement of BS:5514.

Vibrations :

Vibrations should be measured during full load testing as well as during overload testing and this limit should be limited to 300 microns.

Check of Fuel Consumption : A check of the fuel consumption shall be made throughout the test run of full load and overload.

Insulation Resistance of Wiring :

On completion of the engine tests, the insulation of each unit of local wiring in the control cubicles and other components of the engine set, shall be tested with a 500 V insulation tester. The insulation resistance shall not be less than one mega-ohm. between wires in a cable and engine set frame of cable sheath. Test will be done before and after the running of Genset

Functional Tests :

- a) Protective equipment on the engine against excessive cylinder temperature and low lubrication oil pressure.
- b) Type of starting provided for the engine.
- c) Pilot and fault indication lamps.

1.15 DATA SHEET FOR D.G. SETS (To be filled by the Bidder along with the bid)

Sr. No.	PARAMETERS	650 KVA
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1.0 Applicable Standards :

2.0 ENGINE:

- 2.1 Type :
- 2.2 Make :
- 2.3 Model Number :
- 2.4 Engine BHP :
- 2.5 RPM :
- 2.6 Nos. of Inline Cylinder :
- 2.7 Specific Fuel Consumption at 100% Load Litre/Hr. :
- 2.8 Type of Cooling :
- 2.9 Type of Starting :

3.0 ALTERNATOR:

- 3.1 Make :
 - 3.2 Model Number :
 - 3.3 Type of Enclosure :
 - 3.4 Mounting :
 - 3.5 KW Rating :
 - 3.6 KVA Rating :
 - 3.7 Insulation :
 - 3.8 Excitation :
 - 3.9 Cable Terminal Box Provided (Yes/No) :
 - 3.10 Earthing Studs :
- 4.0 Dimensions (LxWxH) :**

5.0 Weight (in Kgs) :

6.0 Anti-vibration pad provided (Yes/No) :

7.0 BATTERY CHARGER:

- 7.1 Type:
- 7.2 Make:
- 7.3 Ampere Hour Rating:

8.0 CONTROL PANEL :

- 8.1 Type :
- 8.2 Facilities provided (bidder to furnish Details & brief description) covered:
 - a) Monitoring :
 - b) Startup :

- c) Changeover :
- d) Operation :
- f) Protection & interlocks & safeguards :
- 8.3 Cable entry :
- 8.4 Weight :
- 8.5 Dimensions :

(NOTE : The tenderer should fill-in all the data in above format only. If above mentioned data is not filled properly or partially filled tender shall be liable to rejection).

9.0 ACOUSTIC ENCLOSURE:

The framework should be made out of CRCA sheet & structural steel with anti-corrosive UV resistant 14 tank powder coated process of all parts. Specially designed acoustic doors shall be provided with glass window for visibility of the DG sets from outside. These doors shall have a proper sealing arrangement to ensure that there is no sound leakage and water leakage. Acoustic enclosure should be suitable for outdoor application having latest process of 14th tank powder quoting to make ensure rigid powder coating quality for longer life.

The enclosure shall be provided with suitable ventilating/exhaust fans for fresh air & hot air exhaust with all accessories required. The ventilation system shall be designed so that the temperature rise in acoustic enclosure shall be less than 15 Degree Celsius below ambient temperature.

The enclosure shall be supplied with necessary anti vibration pads between DG & Enclosure and also between enclosure & foundation.

Specially designed to meet stringent MoEF/ CPCB IV+ norms of 75 dBA at 1mtr distance at 100% load under free field conditions

High quality noise absorbent and fire-retardant grade acoustic Insulation material (Rockwool) complying to IS 8183 External fuel & DEF filling provision. Noise level – 75dB right around measured at a distance of 1 meter from the enclosure.

10.0 EXECUTION :

Bidder shall give necessary inputs for designing the foundations & shall be responsible for design, erection shall happen after completion of foundation works as per OEM’s design. Bidder shall co-ordinate with other agencies like electrical contractors, civil contractors etc.

Further to erection, testing and commissioning of the DG Set, the termination of cables at DG Set, between DG Set and Main LT panel end shall be done by the electrical contractor. Calibration of CTs, approval from statutory authorities like electrical inspectorate/MSEDCL/PWD, CPCB etc shall be the responsibility of the DG supplier. DG supplier shall coordinate with main electrical contractor for necessary control & power cable termination.

11.0 Auto Synchronizing & Auto Load Sharing Panel:

Modification of Existing DG Set: The bidder should note that any modification required in Engine, Alternator and Governor level as well as any necessary modification in wiring, relays, controller or any additional material required to synchronize the existing DG Set with the new DG Set shall be the responsibility of the DG Set bidder. The bidder must check the same on site before quoting.

Synchronization of different makes of DG sets shall be the responsibility of the 'Bidder' so as to ensure smooth operation of DG set power at various plant loads and error free system.

All internal wiring shall be of FRLSH 1.1 KV grade, PVC copper wires. CT shorting links are to be provided for Ammeter and protection circuit.

12.0) GENERAL: The panel shall be metal clad, totally enclosed, rigid, compartmentalized design, floor mounting, air insulated, extensible cubicle type for use on low voltage power, 415V, 3 phase 4 wire, 50 Hz system. The equipment shall be designed for operation in high ambient temperature and high humidity tropical atmospheric conditions. Means shall be provided to facilitate ease of inspection, cleaning and repairs for use in installations where continuity of operation is of prime importance.

STANDARDS:

Following equipments shall conform to the requirements as per the latest revisions of the following standards: -

1. Air Circuit Breaker (ACB) : IS 13937- 1&2 / IEC 60947 – 1&2
2. Moulded Case Circuit Breaker (MCCB) : IS 13947 – 1&2/ IEC 60947 – 1&2
3. Contactors : IS 13947-1&4
4. Miniature Circuit Breaker (MCB) : IS 8828- /IEC 60898
5. Residual Current Circuit Breaker (RCCB) : IS 12640 - / IEC 1008
6. HRC fuse link : IS 9224 and BS 8:8
7. Current Transformer : IS 2705 and IEC 185
8. Potential Transformer- : IS 3156
9. Relay -(For Static Relays) : IS 3231 and IS 8686
10. Indicating Instrument- : IS 1248

- a) All CTs for metering/protection shall be mounted in respective feeder compartments either in front or on the rear side of the same compartment for easy maintenance without disturbing other feeders.
- b) Mounting of any metering OR instrumentation equipments in Bus chamber is not envisaged.
- c) All CT wiring shall be done with CT terminal block with shorting facility mounted in the metering compartment.
- d) Wherever control wiring is done between the shipping sections, terminal blocks shall be provided on both sides of shipping sections with TB diagram pasted near to the TBs.

- e) The total height of the panel shall not be more than 2200mm unless otherwise specified and maximum height of switch operating handle shall not be more than 1800mm from FFL. The maximum shipping section shall be of 2000mm width. The total depth of the panel shall be adequate to cater for proper cabling space.
- f) Sheet thickness shall be as below
- Main frame : 2.5/3mm
 - Doors : 2mm
 - Covers/partitions : 2mm
 - Gland plate : 3mm

Wherever single core cables are used, 3mm thick aluminium gland plate shall be provided. All sheet steel work forming the exterior of switchboards shall be smoothly finished, levelled and free from flaws. The corners should be rounded.

g) The Components in the switchboards shall be so arranged as to facilitate ease of operation and maintenance and at the same time to ensure necessary degree of safety.

- h) Components forming part of the switchboards shall have the following minimum clearances:
- | | |
|----------------------------|--------|
| Between phases | - 30mm |
| Between phases and neutral | - 25mm |
| Between phases and earth | - 25mm |
| Between neutral and earth | - 25mm |

Creepage distances shall comply to those specified in relevant standards.

- i) All insulating material used in the construction of the equipment shall be of non-hygroscopic material treated to withstand the effects of high humidity, high temperature and tropical ambient service conditions.
- j) Functional units such as circuit breakers, fuse switches, ACBs, etc. shall be arranged in multi-tier formation except that not more than two air circuit breakers shall be housed in a single vertical section.
- k) Metallic/insulated shrouding shall be provided within vertical sections and between adjacent sections to ensure prevention of accidental contact with Main bus-bars and vertical risers during operation, inspection or maintenance of functional units and front mounted accessories. Cable terminations of one functional unit, when working on those of adjacent unit/units.
- l) All covers providing access to live power equipment/circuits shall be provided with tool operated fasteners to prevent unauthorized access.
- m) Provision shall be made for permanently earthing the frames and other metal parts of the switchgear by two independent distinct connections.
- n) Thickness tolerance for sheets shall be as applicable in relevant IS.
- o) The complete panel shall be designed such that it's rating is as per SLD without derating considering ambient temperature & temperature rise as per IS/IEC. De-rating of ACBs/ACBs or the whole panel

shall not be accepted. Panel shall be provided with necessary ventilation arrangements to meet the above requirement.

(D) EACH VERTICAL SECTION SHALL COMPRISE:

- a) A front framed structure of rolled/folded CRCA sheet steel angle section rigidly bolted together. This structure shall house the components contributing to the major weight of the equipment such as circuit breaker cassettes, fuse switch units, main horizontal bus bars, vertical risers and other front mounted accessories.
- b) The structure shall be mounted on a rigid base frame of folded CRCA sheet steel of minimum 6 mm thickness and 100 mm height or ISMC100. The design shall ensure that the weight of the components is adequately supported without deformation or loss of alignment during transit or during operation.
- c) A cable chamber housing the cable end connections and power/control cable terminations. The design shall ensure generous availability of space for ease of installation and maintenance of cabling and adequate safety for working in one vertical / horizontal section without coming into accidental contact with live parts of the adjacent section.
- d) A cover plate at the top of the vertical section, provided with a ventilating hood wherever necessary. Any aperture for ventilation shall be covered with a perforated sheet having less than 1mm diameter perforations to prevent entry of vermin.
- e) Front and rear doors fitted with dust excluding neoprene gaskets with fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors generous overlap shall be ensured between sheet steel surfaces with closely spaced fasteners to preclude the entry of dust.

(E) METAL TREATMENT AND FINISH :

- a) After fabrication, the panel shall undergo minimum 14th tank pre-treatment process for removing grease, Rust etc. and UV resistant powder coating of all parts to withstand extreme environment the panel shall be coated with zinc chromate primer (Applicable for outdoor panels).
- b) After coating of primer, the panel shall be coated with Epoxy based paint (powder coating/spray paint). Paint shade shall be as specified by the client/consultant during drawing approval.
- a) temperature rise of 40 Deg. Celsius above the ambient temp. of 50 deg. Celsius. Current density (Amp/Sq.mm) shall be 1 A/sq.mm for copper & 0.8 A/Sq.mm for Aluminium.
- b) The neutral bus bars shall have a continuous rating of at least 100% of the phase bus bars unless otherwise mentioned.
- c) Bus bars shall be fully sleeved using heat shrunk PVC sleeves appropriately colour coded to identify different phases and neutral bar.
- d) All lighting & raw power panels/SMSBs shall be provided with neutral bus rated same as the size of Phase Busbars unless otherwise specified in SLD.
- e) MCCB/ACBs of rating 200A & above rating shall have copper spreaders on terminals & then connected to main busbars.

- f) All panels shall be provided with aluminium earth bus, which shall run throughout the length of switch board at top or bottom as required. Following size of earth bus shall be provided as per the switchboard rating:

PANEL RATING	Al. EARTH BUS SIZE
Up to 100A	25x3mm
250A	30x6mm
315A	30x10mm
400 to 630A	60x10mm
800 to 1000A	125x10 mm
1250 to 2000A	100x10mm
2500 to 3200A	150x10mm
4000A	150x10mm

(G) POWER/CONTROL WIRING:

All control wiring shall be carried out with 1100/660 V grade single core PVC-FRLSH cable having stranded copper conductors with minimum cross section of 1.5 Sq.mm for potential & control circuits and 2.5 Sq.mm for current transformer circuits. Control wiring for analog, digital inputs/outputs shall be done with 1.5/1 Sq.mm screened copper cables. All power cables shall be minimum cross section of 4 Sq.mm.

The colour coding of cables shall be as below:

- a) Power up to 25 Sq.mm : Red/Yellow/Blue/black
- b) CT & PT : Red/Yellow/Blue/black
- c) Control AC : Black/Orange (for interlocks)
- d) Control DC : Grey
- e) Analog/digital circuits : Red/black-screened

Wiring shall be neatly bunched, adequately supported and properly routed to allow for easy access and maintenance. Wires shall be identified by numbered ferrules at each end. The ferrules shall be of ring type and of non-deteriorating material. They shall be firmly located on each termination so as to prevent free movement. All control circuit fuses/MCBs shall be mounted in front of the panel and shall be easily accessible. All CT wiring shall be done with CT terminal block with Shorting facility mounted in the metering compartment.

Wherever control wiring is done between the shipping sections, terminal blocks shall be provided on both sides of shipping sections with TB diagram pasted near the TBs. Control wiring for analog, digital inputs/outputs shall be done with Screened cables & routed separately to avoid EMI.

(H) TERMINAL BLOCKS:

Terminal blocks shall be of 650 Volts grade and of stud/screw type. Terminal blocks shall have a minimum current rating of 16 Amps and shall be shrouded. Provisions shall be made for label inscriptions. At least 25% spare terminals shall be provided on each panel and these spare terminals shall be uniformly distributed on all terminal blocks. Terminal blocks for current transformer and voltage transformer secondary leads shall be provided with test links and isolating facilities with disconnecting type TBs. Also, current transformer secondary leads shall be provided with Terminal block with short circuiting and earthing facilities.

Terminal blocks for power feeders shall be of stud type with bolts & nuts. There shall be a minimum clearance of 250mm between the first row of terminal blocks and the associated cable gland plate. Also, the clearance between two rows of terminal blocks shall be a minimum of 150mm. The blocks shall have colour coding as per standards for easy identifications of wiring (Green, Grey, Black, etc.)

(I) CABLE TERMINATIONS:

a) Cable entries and terminals shall be provided in the switch board to suit the number, type and size of aluminium conductor power cables and copper conductor control cable specified in the detailed specifications.

b) Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided with the position of cable gland and terminals such that cables can be easily and safely terminated.

c) Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

e) Cable risers shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

f) Sufficient height shall be provided between busbar & gland plate in case higher size cable & more number of runs. Min. cable termination heights from gland plate shall be as below:

Up to 35 Sq.mm	: 200mm
50 to 95 Sq.mm	: 250mm
120 to 185 Sq.mm	: 350mm
240 to 400 Sq.mm	: 550-600mm

12.0 INSTRUMENT TRANSFORMERS:

A) CURRENT TRANSFORMERS:

a) Current transformer shall comply with the requirements of IS 2705. They shall have ratios, outputs and accuracy as specified/required. All CT's shall be of resin cast type unless otherwise specifically called for.

b) All CT's shall be of bar type primary or suitable for the cable given type and size.

c) For all the CT's suitable type and size clamps are to be supplied for mounting in the switchboards.

- d) Polarities and terminal markings of primary and secondary shall be clearly marked on all CT's.
- e) Name plate indicating, current ratio, burden, accuracy class, type, Sr. No. Make and Model etc., shall be provided.
- f) Specifications for CT's:

- 1. Current Ratio : As per ratings
 - i. Primary : As per SLD
 - ii. Secondary : 5A
- 2.Type : Resin Cast
- 3.Class : PS-REF Protection
5P10-O/C & E/F Protection
Class 0.5S for metering
- 4. System Voltage : 440 Volts

B) POTENTIAL TRANSFORMER:

- a) All the Potential Transformers shall comply with the requirements of IS 3156 latest editions. All PT's shall be resin cast type and shall have Voltage ratios, output and accuracy class as specified in SLD/Data Sheet.
- b) All PT's shall be single phase, dry type suitable for mounting inside the panel/cubicles. Clamps / brackets / supports required for the mounting shall be supplied along with PT.
- c) Polarities and Terminal markings shall be clearly marked in all PT's.
- d) Name plate indicating, voltage ratio, burden, accuracy class, type, Sr. No. Make and Model etc., shall be provided.
- e) A common earth terminal for earthing of core, bolts, clamps (noncurrent carrying metal parts) etc., shall be provided.

C) CONTROL UNITS:

The Control Units shall be housed in a separate enclosure and there shall be total insulation of the control unit with respect to the power unit.

The Control Unit shall be of LSI based Microprocessor type with LCD screen & suitable to provide protection against short circuit, overload, Instantaneous SC currents, neutral and earth fault protection with adjustable time delay.

The setting range of the short circuit protection shall be from 3 to 9 x In and 5 to 15 x In.
The overload settings shall be adjustable from 0.4 to 1.0 times the rated current.

The breaker shall provide Earth fault protection from 0.2 to 0.7 times rated current. Neutral protection of 1-50-100% of Ir range.

The LCD display shall monitor the measured current values (average & peak), faults and log (the cause of last trip and maintenance operations).

D) ACCESSORIES:

The connection for the auxiliary shall be accessible from the front.

ACB shall be provided with following accessories, in addition to the item specified in Bill of Quantities. Further these devices shall be fittable at site from the front and common for all ratings.

- a) Under Voltage trip coil.
- b) Shunt trip coil.
- c) Closing coil,
- d) 4NO + 4NC auxiliary switches.
- e) Fault indicator/Reset unit.
- f) Pad lock & LOTO facility

E) INTERLOCKING:

ACBs shall be provided with the following interlocking: -

- a) Pad lock to prevent unnecessary manipulations of the breaker.
- b) Electrical interlock shall be done by using breaker aux. contacts only

13.2 MOULDED CASE CIRCUIT BREAKER

The Moulded Case Circuit Breaker shall be incorporated in the switchboard wherever specified and shall be of the current limiting type. CB shall conform to IS 2516, IS 13947-1/ IEC 947-1 (part I & II / section 1) 1977 for general rules. It should be suitable for Horizontal and Vertical mounting and line load reversibility. CB shall be suitable either for Single Phase AC 230V Or Three Phase 415V. The MCCB/ACB shall be available in four pole versions for neutral isolation. It shall have tropicalisation as standard feature. The ACB/MCCB cover and case shall be made of high strength heat-resistant and flame retardant thermosetting insulating material. The operating handle shall be quick make, quick break, trip - free type. The operating handle shall have suitable 'ON' 'OFF' 'TRIPPED' indicators and in order to ensure suitability for isolation complying with IS 13947-2/IEC947-2, the operating mechanism shall be designed such that the toggle or the handle can only be in 'OFF' position, if the main contacts are actually separated.

A) ACCESSORIES:

MCCB shall be designed to have following accessories and it shall be fittable at site.

- 1) Under voltage trip
- 2) Shunt trip
- 3) Alarm switch
- 4) Auxiliary switch

B) INTERLOCKING:

CB shall be provided with following interlocking devices for interlocking the door of a switch board.

- a) Handle (Pad lock) interlock to prevent unnecessary manipulations of the breaker.
- b) Door interlock to prevent door being opened when breaker is in ON position.

c) The interlocking defeating device to open the door even if the breaker is in ON position, In addition to the above, all other features indicated in the Bill of Quantities/SLD shall also be provided.

C) BREAKING CAPACITY:

Short time with-standing capacities & breaking capacities for different ratings of ACBs shall be as specified in the SLD.

Preferably Ics shall be equal to Icu or all breaking capacities shall be considered for Ics.

D) RELEASES:

Unless otherwise specified all CBs up to 250A (including 250A) shall be provided with thermal magnetic releases & all CBs of rating 315A & above rating shall be provided with Microprocessor releases.

All CBs with Thermal magnetic releases shall be provided with adjustable overload of 70-80-100% & fixed short circuit releases.

All CBs with Microprocessor releases shall be provided with adjustable overload of 50- 100% & adjustable short circuit releases.

Wherever earth fault module is required it shall be inbuilt with other releases, i.e. separate module for E/F is not recommended.

14.0 AMF Relay :

AMF Relay having numeric digital controller technology, Alpha numeric LCD displays with keypad having supervision of 3 phase mains voltages & DG voltages, remote starting & stopping facilities, 3 operating modes i.e automatic, remote, manual, password protection & able to start the stand by generators in case of main failures. The relay should at least following features:

- 1) Display of voltage, frequency of mains parameters
- 2) Display of generator parameters like V, Hz, Speed, Run hours
- 3) Measurement of load current
- 4) Site name & no. is programmable
- 5) Digital inputs, 6 relay outputs, 11 LEDs
- 6) Last 3 faults & events record
- 7) Internal interlock for EB & DG breaker for fail safe operation
- 8) Wide array of time circuit for start delay, stop delay, mains restoration, recooling etc.

- 9) Full engine safety function like :
 - 9.1) Over / Under frequency, speed indication, shutdown
 - 9.2) DG fault like fail to start, fail to stop & low battery
 - 9.3) Overload protection & selectable overload setting
 - 9.4) Protection against undesired conditions monitored via digital inputs
- 9.5) Protection against engine faults like LLOP, SCT, Low fuel & over speed, phase reversal etc

15.0 Synchronization Controller Relay for Generators :

The Synchronization Controller should have programmable atleast 10 digital inputs, 18 analogue input, 8 output relays, 2 analogue output & communication port like RS 232, RS 485, USB, ethernet & Bus communication & suitable converter for bacnet bus. It may also be indicated whether Stand Alone SNMP protocol-based communication interface is available for the generator control panel. The controller shall be able to control/monitor following alarms of engine & alternator:

- 1) Engine temperature warning (analog sensor)
- 2) High engine temperature alarm (analog sensor)
- 3) Temperature analog sensor fault
- 4) High engine temperature alarm (digital sensor)
- 5) Oil pressure warning (analog sensor)
- 6) Low oil pressure alarm (analog sensor)
- 7) Oil pressure analog sensor fault
- 8) Low oil pressure alarm (digital sensor)
- 9) Temperature digital sensor fault
- 10) Fuel level warning (analog sensor)
- 11) Low fuel level alarm (analog sensor)
- 12) Fuel level analog sensor fault
- 13) Low fuel level alarm (digital sensor)
- 14) High battery voltage
- 15) Low battery voltage
- 16) Faulty battery
- 17) Battery charger alternator fault

- 18) Low engine speed
- 19) High engine speed
- 20) Starting failure
- 21) Emergency button
- 22) Mechanical failure
- 23) Stop failure
- 24) Low generator frequency
- 25) High generator frequency
- 26) Low generator voltage
- 27) High generator voltage
- 28) Generator overload
- 29) External generator protection
- 30) Generator wrong phases sequence
- 31) Mains wrong phases sequence
- 32) Wrong frequency setting
- 33) Generator contactor fault
- 34) Mains contactor fault
- 35) Internal system error
- 36) Expired rental hours
- 37) Low water level in the radiator
- 38) Ambient temperature too high
- 39) Ambient temperature too low

15.1 Controller shall be able to manage at least following functions:

- 1) Mains/Generator Auto synchronization

- 2) Generators synchronization without limits
- 3) Bus communication
- 4) TCP/IP static address, for Ethernet/LAN control
- 5) Insulated analog output for voltage regulator +/-5V
- 6) Insulated analog output for RPM regulator 0-10V or 10-0V
- 7) Insulated voltage inputs 500Vac or 100Vac
- 8) Insulated inputs
- 9) Current measurements on Dead Bus
- 10) Active and reactive power sharing
- 11) Synchronization between sources with different powers
- 12) Quick control by display of voltage and current parameters
- 13) Sharing on mains when the mains voltage returns
- 14) Synchronoscope and "zero voltmeter" for manual operation
- 15) Self-learning function for quick and auto managed synchronizing
- 16) Management of mixed systems with several mains and several generators
- 17) Complete remote-control system,

16. Cables

1) Codes and Standards:

The design, material, construction, manufacture, inspection, testing and performance of LV FRLS, XLPE power cables supplied shall comply with all currently applicable statutes, regulations and safety codes in the locality where the material will be installed. Nothing in this specification shall be construed to relieve the BIDDER of his responsibility. Where no standards are available, the supply items shall be of good quality and workmanship and backed by test results. Any supply items which are bought out by the BIDDER shall be procured from MANUFACTURERS approved by the PURCHASER.

The cables covered by this specification, unless otherwise stated, shall be designed in accordance with the latest editions of the following standards.

IS 7098 -1988 (Part I)	Specification for XLPE insulated electrical cables
IS 8130-1984	Specification for conductors for insulated electric cables and flexible cords

IS 5831-1984	Specification for PVC insulation and sheath of electric cables
IS 3975-1988	Specification for mild steel wires, strips and tapes for armouring cables
IS 694	PVC insulated cables for wiring (1100V)
The cable manufacturing company should have been qualified for ISO-9001/2.	

2) Design and Manufacturing Requirements:

Following are the technical particulars for the cables:

Power supply : 415V, 3 phase, 4 wire,
 Grounded system : Solidly grounded.
 System fault level : 35 MVA (50 KA) symmetrical.
 : Aluminium conductor, Cu conductors, XLPE insulated, armoured power cables
 Voltage grade : 1100 Volts
 No. of cores : 3 ½ core; 1 core

The cables supplied under this specification shall be aluminium/copper conductor, XLPE insulated, FRLS PVC sheathed and steel wire armoured cables. Adequate insulation shall be provided for the cables to operate continuously at the specified voltage with a high degree of safety and reliability throughout the life of the cables. The insulating and sheathing materials shall be high quality XLPE and PVC based compound respectively.

The armoured cables shall conform to the following construction: XLPE insulated stranded & shaped aluminium conductor cable (as the case may be) with cores suitably laid up, extruded with inner sheath of unvulcanised rubber or thermo-plastic material compatible with insulating material, round steel wire armoured and overall extruded with general purpose FRLS PVC outer sheath, black conforming to IS: 7098 (Part- I):1988, 1.1KV grade.

The insulating material for power cables shall be cross linked polyethylene (XLPE) compound as per IS-7098 (Part-I/II)-1988. Gas curing process is desirable for XLPE insulation. The average thickness of insulation shall not be less than the values specified in Table-3 of IS-7098 (Part-I)-1988. The cores shall be identified by the following colour schedule:
 3&1/2 core: Red, yellow, blue, black, reduced neutral core being black.

3) Inspection and Testing:

The BIDDER shall carry out all the shop tests and inspections specified in the following clauses in addition to those normally carried out by him. For Material not covered by any code or specifically mentioned in this specification, the tests are to be agreed with the PURCHASER. All type tests, acceptance tests, routine tests and physical tests for LV power Cables, shall be carried out as per relevant Indian and International standards like IEEE, IEC, ASTM etc, If the MANUFACTURER has already conducted the type tests, then the type test certificates shall be submitted along with his offer.

All the tests specified below shall be carried out in accordance with relevant Indian Standards by the manufacturer in the presence of purchaser’s representative. **If the cable fails to pass the test**

specified, the purchaser shall have the option to reject it.

3.1 Routine Tests:

The following routine tests shall be carried out on each and every length of the cable in the presence of purchaser's representative at manufacturer's works.

- i) Resistance test for Aluminium/copper
- ii) High voltage test.

3.2 Type tests:

The following type tests shall be carried out on samples taken out from the production lot.

- i. Tensile test for conductor
- ii. Wrapping test for conductor
- iii. Resistance test for conductor.
- iv. Test for thickness of insulation and sheath.
- v. Physical test for insulation and sheath.
- vi. Fire resistance test.
- vii. Insulation resistance test.
- viii. High voltage test (water immersion test).
- ix. Tests on armour wires.

3.3 Acceptance tests:

- i. Tensile test (for aluminium).
- ii. Wrapping test (for aluminium).
- iii. Conductor resistance test.
- iv. Test for thickness of insulation and sheath.
- v. High voltage test.
- vi. Insulation resistance test.

3.4 FRLS tests:

- i. Critical Oxygen index as per ASDM-D 2863
- ii. Temperature index as per ASTM-D 2863 & BICC Handbook Chapter No. 6
- iii. Smoke Density (Light Transmission) as per ASTM -D 2843
- iv. Acid gas generation as per IEC 754-1
- v. Flammability tests as per IEC 332-1 and IS 694:1990

• Optional Tests

- i) Cold bend test for outer sheath.
- ii) Cold impact test for outer sheath.

The purchaser at his option may waive all or any of the type tests, provided type test certificate carried out on essentially identical cable are furnished by the manufacturer.

4) Guarantee:

The cable shall be guaranteed against any type of defects and for trouble free operation conforming to this specification for a period of at least 24 months from the date of commissioning

or 30 months from the date of despatch from the supplier's works, whichever is earlier. The following performance characteristics of cables shall be guaranteed at the maximum continuous rating, when operating under the specified operating conditions:

- i) Voltage drops.
- ii) Maximum current rating.
- iii) Operating conductor temperature.
- iv) Resistance at 20 deg C.

5) Identification Marks:

The manufacturer shall be identified throughout the length of the cable by the manufacturer's name or trade mark indented or embossed on the outer sheath of the cable. The cable shall be identified as per clause 17 of IS:1554 (Part- I)-1988.

17. Earthing System

Maintenance free earthing shall be carried out CPRI approved Strip in Pipe technology stable grounding back fill compound for a long period of time. 76 mm outer pipe dia, 50X5 mm inner strip, 6000 mm long hot dipped GI earthing electrode with 25 Kg x 4 Nos. back fill compound bags. Hot dipped GI coating must be above 80 microns. Outer pipe must be embossed with IS marke and follows IS-1239:1990 (Part1). Wall thickness of outer electrode should be 3.20 mm. It should be electrically conducting & not dependant on moisture & confirming to ANSI/NSF Standard 60, will not diffuse in to the ground, will not expand or experience any shrinkage but remain in constant contact with earth & should be able to reduce contact resistance to earth significantly (at least 40 %) & create a low steady state impedance for a very long period resulting in faster transient dissipation. Providing masonry enclosure with medium duty RCC frame & Cover having locking arrangement and disconnecting/ testing links etc as per IS -3043 complete as required.

The premixed powder set carbon based backfill compound shall be poured in the bore with water and re- close the bore (Preapproval needed from client). Earthing shall be covered with RCC enclosure of size 450 mm (Length) x 450 mm (Breadth) x 100 mm (Thick).

Note: Contractor must visit/ inspect the work site, before quoting.

BMS Requirement: DG Bidder to ensure the BMS system architecture shall be able to satisfy the client's requirement. Following are some of requirement listed for guidance but not limited to:

1) RS 485 / Backnet Output from each DG set for our BMS
Analog input along with monitor points for fuel level, generated voltage, current, engine temperature, radiator temperature, Battery voltage, changing current & over speed, winding temperature, RPM frequency etc.
3) Potential free contacts from each DG set breaker for BMS for ON/OFF/Trip status
4) BMS Controller with 5 Universal Inputs and 5 Binary Outputs in MS Enclosure with required power supply connectors, internal wiring
5) Convertor with 2 inputs and 1 RS 232 output, cabling etc.
6) Software for Graphical presentation

DG Supplier should provide for all required hardware (convertor to give bacnet combability, control wiring, potential free NO/NC, RS ports, A/D & D/A converters etc. as required to operate the BMS system software.) arrangement for remote start/stop and DG fault (LLOP, over speed) etc along with remote adjustment of voltage & speed of the engine (Motorised/ solid state pot may be required) & shall be included in the quoted rates as

required.

Hiring of 650 Kva DG Set:

- 1) 650 KVA Three Phase, Four Wire DG Set on rent for 48 hours with skilled DG Set Operator. Hired DG Set is required at the time of commissioning and load testing of new DG Set.
- 2) DG Set must be of prime continuous duty rating, good quality and there should be no interruption in the functioning of hired DG Set.
- 3) Rated power cables from hired DG Set to MCCB Panel (located in IUCAA Substation, minimum 30 meters) with proper lugs and MCCB should be provided to 'turn on-off' the load by DG Set Bidder.
- 4) Diesel will be provided by IUCAA.
- 5) All risk will be covered by the DG set bidder/owner/supplier, including insurance if any.
- 6) The DG Set must have acoustic enclosure (Sound Proof Canopy) with residential grade silencer, good batteries and proper earthing cables.
- 7) Including transportation, loading/ unloading, connection/disconnections of power cables etc. of the DG Set at IUCAA Substation.

Seal & Signature of Bidder

LIST OF APPROVED MAKES

Sr. No.	Name of Item	Approved makes
1	MCB Distribution Boards	Wipro/ North West/Siemens / ABB
2	Air Circuit Breaker (ACB)	Siemens-3WL /Legrand- DMX3/ L& T-Omega
3	MCCB/MCB	Siemens /ABB/ L& T/ North West/ Schneider
4	Switch Fuse Units	Siemens /ABB/ L& T/ North West
5	Contactors and Starters	L&T / Siemens / ABB/ Schneider
6	DG Set	Cummins/ Caterpillar/ Sterling / Kirloskar
7	GSS sheets/ Steel Angles/Channels	Jindal/ SAIL-Bhilai/ TATA
8	Hardware	Sundaram/ GWK/ Fit tight
9	Anchor Fasteners	Hilti / Shakti
10	Paints	Nerolac, Asian, Berger
11	Welding Rods	ESAB/ Advani-Orlecon
12	ELCB/RCCB/RCBO	Siemens /ABB/ L& T/ North West
13	Push Buttons	L&T / Technic / Schneider
14	Indicating Lamps	L&T / Technic / Schneider
15	Fuses & Fuse bases	L&T / Siemens /ABB
16	Indicating / Measuring Instruments	Conzerv/ HPL/ Secure/ L&T
17	Terminals	Elmex / Connectwell
18	LT Cables/Wires	Finolex / RR Kables / Gloster
19	Timer	L&T/ABB/Minilec
20	Cable Glands Single/Double	Braco / Dowells
21	PVC rigid conduits & Accessories	Precision/ Astral
22	Bi-metallic Crimping Type Lugs	Dowells
23	Cable Trays / Wireways	Cablofil / Profab / Shruti
24	Multi-Function Meter	L & T / Conzerv/ HPL

Note: Bidder must highlight make of goods/items offered as per approved make list.

SEAL & SIGNATURE OF BIDDER

650 KVA DG Set Data Sheet (To be filled in by Bidder)		
Sr. No.	Data Description	Complied with Specifications (Fill in information)
1	Engine Make & Model Name/ No. (Technical specifications / literature / brochure must be attached)	
1.1	Engine Type	
1.2	Engine BHP	
1.3	Number of Cylinder	
1.4	RPM	
1.5	Type of Cooling	
1.6	Type of Starting	
1.7	Type of Governor, Make & Model Number	
1.8	Fuel consumption at 75 % load (Litre /Hr)	
1.9	Fuel consumption at 100% load (Litre /Hr)	
1.10	Lube Oil Consumption @ % of fuel consumption	
1.11	Lube oil change period in DG running hours or minimum Period in months	
1.12	Lube Oil Sump Capacity (Max) in Litre (High - Low Level)	
1.13	Total Lubrication System Lube Oil Capacity in Litre	
1.14	Total Coolant capacity in Litres	
1.15	Engine Radiator Fan Power required in HP/Kw	
1.16	Maximum time to start engine from cold and attain rated speed & ready to take one step load in Seconds	
2	Alternator Make & Model Name/ No. (Technical specifications / literature / brochure must be attached)	

2.1	KVA Rating	
2.2	KW Rating	
2.3	Class of Insulation	
2.4	Excitation	
2.5	Alternator Efficiency	
2.6	Voltage Regulation in %	
2.7	Waveform Distortion in %	
2.8	Total Harmonic Distortion in %	
2.9	Telephonic Harmonic Factor	
2.10	Enclosure IP rating	
2.11	Mounting	
2.12	Terminal Box Provided	Yes/ No
2.13	Earthing Studs Provided	Yes/ No
3	Transient speed increase for sudden 100% decrease of load in %	
4	Transient speed decrease for sudden 100% increase of load in %	
5	Recovery Time in Seconds	
6	Overall Dimensions of Generator Set in mm (Length X Width X Height)	
7	DG Set Weight in Kg	
8	Battery Charger – Make & Model Number	
9	Battery Charger Ratings (Volt & Current)	
10	Batteries Rating (Voltage & AH)	
11	DG AMF & Synchronising Panel from approved panel manufacturer only (Give the name of panel manufacturer)	

12	Make & Model Number of AMF Controller	
13	Make & Model Number of Synchronisation Controller	
14	DG Set should accept 55% of rated capacity in one step.	Yes/ No
15	DG set engine offered must be compatible for dual fuel application (i.e. HSD & Natural Gas)	Yes/ No
16	DG Sets panel shall be suitable for Auto synchronisation operation controlled through AMF/Synchronise Relay as well as manual operation.	Yes/ No
17	Vendor to provide one-source responsibility for the generating system and accessories.	Yes/ No
18	The generator set and its components are prototype-tested, factory-built, and production-tested.	Yes/ No
19	The product should provide support for monitoring various parameters of diesel generator set over WEB and SNMP".	Yes/ No
20	Name and Address of Service Centre at Pune	
21	Response time from service centre after launching a complaint	
22	Response time for required spare parts from service centre after launching a complaint	
23	The Diesel Generator is to provide backup power when the electric mains power has a failure. The generator set is to have "primary continuous duty " application of providing power continuously for more than 16 hours on a given day. Please see the main specifications for additional details	Yes/ No
24	The Diesel Generator is to provide backup power to the uninterruptible power supplies of data centre/digital equipments and the cooling system equipments. The Generator has to meet the full load of UPS & Chiller (supporting the server equipments) in the event of mains failure in a single step after starting and stabilizing within 30 seconds in a seamless manner. In addition, the cooling equipment loads will get connected too. The DG SET of engine, alternator should be rated for meeting this step load application (near full load) on start up/running.	Yes/ No

25	<p>The IUCAA has a comprehensive intelligent building management system for monitoring the parameters of electrical power, temperature, humidity, entry into data centre area, fire alarm and control. The Diesel Genset operational parameters as detailed in the main specifications have also to be monitored by the BMS. Parameters which are crucial for the reliable operation of data centre operation such as fuel and lubrication oil levels in the tanks/ sump respectively, line voltage, current, frequency, battery voltage, charging current, engine temperature are to be provided as analog/digital levels or codified digital data through specified interface. This is an essential requirement to be met by the vendors of the DG set. The scope of BMS for DG set include the transducers for all parameters, hardware and software system as applicable for transferring the parameter to main BMS with backnet protocols and local logging of the engine parameters on dedicated stand alone system too.</p>	Yes/ No
26	<p>A lubricating oil filter shall be provided for operation under normal conditions for a period of 500 hours/ One Year without the necessity of its replacement or cleaning</p>	Yes/ No
27	<p>The DG Sets shall be subjected to load tests at IUCAA site after installation in the presence of IUCAA's engineers with consultant. All the consumables required during testing of DG Sets at site shall be included in the scope of DG vendor. All consumables required during trial run of DG Sets on load for 13 hours out of which six hours for run up to full load, followed by six hours on full load and concluded by one hour 110% overload capacity to be arranged by DG vendor. Also, DG vendor to arrange the 110% Load bank availability for testing. The test shall be carried out as per Technical Specification & records to be submitted for approval. (The formats of all tests carried out at factory & at site with details of relevant standards as per latest standards & permissible limits should be submitted by DG vendor for reference along with tender).</p>	Yes/ No

28	Mandatory Spare Parts: The list of mandatory spares which are considered essential by the Supplier shall be indicated in the bid for successful operation of DG Set for 3 years. Price may also be quoted separately for these spares.	Yes/ No
29	Warranty Period (after satisfactory installation, testing & commissioning)	

NOTE:

- 1) The bidder should fill-in all the above-mentioned details.**
- 2) OFFERS with “INCOMPLETE INFORMATION” ARE LIABLE TO BE REJECTED, which may be noted.**

Seal & Signature of Bidder

FORM - I**DETAILS OF WORKS OF ALL SIMILAR TYPE (SITC OF 650 KVA & ABOVE RATING) AND MAGNITUDE CARRIED OUT BY THE BIDDER (REFER ELIGIBILITY CRITERIA (SECTION II - Point No. 3) OF COMPLETED WORKS)**

(DETAILS OF PROJECTS SHALL BE FILLED IN THE CHART AS PER REQUIREMENT WITH PROOF)

NAME OF THE BIDDER:

Sr. No.	Name of work	Name and address of the organization from whom the work was done	Place and Country	Agreement	Date of commencement	Estimated cost (In Lakhs)	Total cost of work done (In Lakhs)	Date of Completion	Principal Features in brief
1	2	3	4	5	6	7	8	9	10

Signature of Bidder

Note: - This is only a standard form. Details are to be furnished in this format in the form of type written statements which shall be scanned and attached in COVER No. I. The work done certificates shall be attached in support of the works claimed in this form. The work done certificates shall be duly signed by the officer not below the rank of Deputy Engineer.

FORM - II**STATEMENT SHOWING ON-GOING WORK OF SITC OF 650 KVA AND ABOVE DG SET WORK
(DETAILS OF PROJECTS SHALL BE FILL IN THE CHART AS PER REQUIREMENT WITH
PROOF)**

NAME OF BIDDER:-

Sr. No.	Name of work	Amount Put to Tender/ Tendered cost	reement No.	Date of Commencement and Date of Completion (if work completed) (Rs. In Lakhs)	Amount of work still remaining to be executed (Rs. In Lakhs)	Remarks
1	2	3	4	5	11	12
Grand Total						
Annual Turnover						

Signature of Bidder

Note: - This is only a standard form. Details are to be furnished in this format in the form of type written statements which shall be scanned and attached in COVER No. I. The work done certificates shall be also attached in support of the works claimed in this form. The work done certificates shall be duly signed by the officer not below the rank of Deputy Engineer.

UNDERTAKING/ACCEPTANCE

(On non-judicial stamp paper worth Rupees 100/- and notarized)

1. I,..... son/ daughter/ wife of Shri.....Proprietor /Director / authorized signatory of the Company / Firm mentioned above, is competent to sign this declaration and execute this tender document.
2. I have carefully read and understood all the terms and conditions of the tender and undertake to abide to them.
3. The information / documents furnished along with the above tender form are true and authentic to the best of my knowledge and belief. I am well aware of the fact that furnishing of any false information / fabricated document would lead to rejection of my tender at any stage besides liabilities towards prosecution under appropriate law.

Place:

Authorised Signatory Sign and Seal

Date:

DECLARATION

(On non-judicial stamp paper worth Rupees 100/- and notarized)

1. We are not involved in any major litigation that may have any impact of affecting or compromising the delivery of services as required under this tender.
2. We are not black-listed by any Central / State Government / Public Sector Undertaking in India.
3. I/ We hereby declare that I/ We have read and studied in detail the all instructions and conditions of this Contract in the above Clauses, and understood the scope of the project/ work and my/our fundamental duties and responsibilities under this Contract. I/ We unconditionally accept and agree to abide by them.

Yours faithfully,

(Signature of the Authorized person)

Date:

Name:

Place:

Designation:

Seal:

**SELF-CERTIFICATION REGARDING LOCAL CONTENT (LC) FOR GOODS, SERVICES OR WORKS
(TO BE PROVIDED ON THE LETTER HEAD)**

Date:

I.....S/o, D/o, W/o..... R/o do hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of IUCAA Pune issued vide Tender Enquiry No. dated

That the information furnished hereinafter is correct to best of my knowledge and belief and I undertake to produce relevant records before the procuring authority or any authority nominated by IUCAA, Pune for the purpose of assessing the LC.

That the LC for all inputs which constitute the said Goods /Services/Works has been verified by me and I am responsible for the correctness of the claims made therein.

That in the event of the LC of the Goods/Services/Works mentioned herein is found to be incorrect and not meeting the prescribed LC norms, based on the assessment of an authority nominated by IUCAA, Pune and I will be liable as under clause 9(f) of Public Procurement (Preference to Make in India) Order 2017.

I agree to maintain all information regarding my claim for LC in the Company's record for a period of 2 years and shall make this available for verification to any statutory authorities:

- i. Name and details of the Local Supplier:
(Registered Office, Manufacturing unit location, nature of legal entity)
- ii. Date on which this certificate is issued:
- iii. Product for which the certificate is produced:
- iv. Procuring agency to whom the certificate is furnished:
- v. Percentage of LC claimed:
- vi. Name and contact details of the unit of the manufacturer:

For and on behalf of _____(Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)

<Insert Name, Designation and Contact No.>

Note: Please refer point 50 of General Terms and Conditions of the tender.

NO RELATIONSHIP CERTIFICATE

(On Company Letterhead)

I/We hereby certify that I/We* am/are* related/not related (*) to any officer of IUCAA Pune. (If related provide the details of the employee)

I/We* am/are* aware that, if the facts subsequently proved to be false, my/our* contract will be rescinded with forfeiture security deposit and I/We* shall be liable to make goods the loss or damage resulting from such cancellation.

I//We also note that, non-submission of this certificate will render my / our tender liable for rejection.

Authorized Signatory Name:

Designation:

Contact No.:

Date:

Place:

**(TO BE PRINTED ON LETTERHEAD)
EMDREFUNDREQUEST**

To
The Director
Inter-University Centre for Astronomy &
Astrophysics Post Bag - 4, Ganeshkhind,
Pune University
Campus, Pune - 411007.

Sub: - Request for refund of EMD deposited for tender for "SITC of 650 KVA DG SET work at IUCAA Pune."

Sir,

I/We request you that EMD deposited by me/us against the tender above, vide UTR No dated for **Rs. 2,54,000/-** for "SITC of 650 KVA DG SET work at IUCAA Pune" may kindly be refunded.

Yours faithfully,

(Signature of the Authorized Person)

Date:

Name:

Place:

Designation:

Seal:

TENDER ACCEPTANCE LETTER
(TO BE GIVEN ON BIDDER'S LETTER HEAD)

Date:

To
The Director
Inter-University Centre for Astronomy & Astrophysics
Post Bag - 4, Ganeshkhind, Pune University
Campus, Pune - 411007.

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: _____

Name of Tender / Work: - _____

Dear Sir,

1. I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work from the website(s) namely: _____ as per your advertisement, given in the above-mentioned website(s).
2. I / We hereby certify that I / we have read the entire terms and conditions of the tender document (including all documents like annexure(s), schedule(s), etc.), and I / we shall abide hereby by the terms / conditions / clauses contained therein.
3. The corrigendum(s) issued from time to time by IUCAA too have also been taken into consideration, while submitting this acceptance letter.
4. I / We hereby unconditionally accept the tender conditions of above-mentioned tender document(s) / corrigendum(s) in its totality / entirety.
5. I / We do hereby declare that our Firm has not been blacklisted/ debarred/ terminated/ banned by any Govt. Department/Public sector undertaking.
6. I / We certify that all information furnished by our Firm is true & correct and, in the event, that the information is found to be incorrect/untrue or found violated, then your department/ organization shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.
7. Restrictions on procurement from bidders from a country or countries, or a class of countries under Rule 144 (xi) of the General Financial Rules 2017: We certify as under:
"We have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to bidders from such countries, and solemnly certify that we fulfil all requirements in this regard and are eligible to be considered. We certify that:
 - i. *we are not from such a country or, if from such a country, we are registered with the Competent Authority (copy enclosed). and;*
 - ii. *we shall not subcontract any work to a bidder from such countries unless such bidder is registered with the Competent Authority.*

Yours Faithfully,
(Signature of the Bidder, with Official Seal)