SETTING UP OF ABOUT 3.0 MW WIND ENERGY FARM FOR CAPTIVE USE & ABOUT 5.0 MW WIND ENERGY FARM FOR SALE TO UTILITY IN MAHARASHTRA STATE ON EPC (BOT) CONTRACT BASIS

TENDER SPECIFICATION DOCUMENT

FEBRUARY 2007

MANGANESE ORE (INDIA) LIMITED
(A GOVT OF INDIA UNDERTAKING)
3 MOUNT ROAD EXTENSION P.B.NO 34
NAGPUR, 440 001(MAHARASTRA)

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For

SETTING UP OF ABOUT 3.0 MW WIND ENERGY FARM FOR CAPTIVE USE & ABOUT 5.0 MW WIND ENERGY FARM FOR SALE TO UTILITY IN MAHARASHTRA STATE ON EPC (BOT) CONTRACT BASIS

Issued to

M/s……
……
……

Sr.Dy General Manager (Elect&PP)
Date: Manganese Ore (India) Limited
West court Katol Road
Nagpur.

MANGANESE ORE (INDIA) LIMITED,
A GOVT. UNDERTAKING
WEST COURT, KATOL ROAD
NAGPUR – 440 013

TENDER NOTICE

Sealed and superscribed tenders are invited from reputed technically competent, experienced firms for design, manufacture, inspection, packing and forwarding, supply, testing and commissioning of Wind Energy Farm in Maharashtra of the following capacity on a turn key basis including annual maintenance for a period of Twenty years since its commissioning from Wind Turbine Generator manufacturers / Collaborators approved by the Ministry of Non-Conventional Energy Sources (MNES) or with International accredited organization approvals, having on approved list of C-WET, Chennai.

Sr.No.	Description of Work	T.E. No.	Amount of EMD Rs. in Lacs.
1.	Setting up of about 3.0 M.W. Wind Energy Farm in Maharashtra State on BOT Basis for captive use. (Capacity of each Wind Mill should be 750 – 1250 KW).	SDG.M.(E)/98/M.S./ 06-07/1307 dated 31/01/2007	15.00
2.	Setting up of about 5.0 M.W. Wind Energy Farm in Maharashtra State on BOT Basis for Sale to Utility. (Capacity of each Wind Mill should be 750 – 1250 KW).	SDG.M.(E)/98/MS/ 06-07/1307 dated 31/01/2007	25.00

The WTG supplier should have the possession of suitable undisputed land having clear title in wind form area / site duly approved by MNES in Maharashtra State for implementation of the project.

The Tender document can be obtained from the office of the Sr.Dy.General Manager (Elect. & PP), West Court, Katol Road, Nagpur on payment (in cash) /by DD in favour of Manganese Ore (India) Limited, Nagpur, being the cost of tender documents i.e. Rs.10,000/-

Detailed information about Tender Notice and Tender Specification Document are available in MOIL Website http:/www.moil.nic.in. In case the tender document is downloaded from the Website, the cost of Tender Document i.e. Rs. 10,000.00 only will

have to be paid by D.D. in favour of Manganese Ore (India) Limited, Nagpur along with Part-I at the time of submission of the application form and bid documents by the tenderer.

Tender Specification Documents will be issued on below mentioned dates between 11.00 am to 16.00 p.m. The tenders are in two parts, Part-I consisting of the Technical & Commercial Bid and Part-II consisting the price bids.

List of similar works with value, which have been executed during last 3 years, should be submitted along with certificate from the concerned authorities.

Latest Income Tax Clearance Certificate / copy of I.T. Return.

MOIL reserves all the rights to cancel / withdraw the tender without assigning any reason. No claim, whatsoever, arising out of such action will be entertained by MOIL.

Tenders in sealed covers duly super scribed with the tender Enquiry No., Closing date and Opening date, along with Demand Draft of any schedule Bank payable at Nagpur for the required amount of E.M.D. should be submitted in the office of the Sr. Dy. General Manager (Elect. & PP) by the stipulated date as per the details given below:-

Commencement date of purchase of Tender	:	07/02/2007
Last Date for purchase of Tender	:	26/02/2007 Upto 16.00 Hrs.
Date of submission of Tender	:	28/02/2007 Upto 15.00 Hrs.

If the last date is declared as Holiday, submission will be next working days.

Date of Opening of Part-I Tender	:	28/02/2007 At 15.30 Hrs.

Date of opening of (Part-II) of tender shall be intimated later.

Sr.Dy.General Manager (Elect & PP)
For MANGANESE ORE (INDIA) LIMITED

Visit us at http:/www.moil.nic.in

MANGANESE ORE (INDIA) LIMITED
(A Government Undertaking)
West Court, Katol Road, Nagpur – 440 013.

Phone No. 0712 – 2591241, 2592112 Fax No. (0712) 2591113

TENDER NOTIFICATION FOR
ESTABLISHMENT OF WIND FARM

Manganese Ore (India) Limited has already installed a 5.0 MW Wind Energy Farm at Dewas, **intends to install Wind Energy Farm in Maharashtra & M.P. for which a Sealed and superscribed tenders are invited from reputed technically competent, experienced firms for design, manufacture, inspection, packing and forwarding, supply, testing and commissioning of Wind Energy Farm in Maharashtra & M.P. of the following capacity on a turn key basis including annual maintenance for a period of Twenty years since its commissioning from Wind Turbine Generator manufacturers / Collaborators approved by the Ministry of Non-Conventional Energy Sources (MNES) or with International accredited organization approvals, having on approved list of C-WET, Chennai.**

1) **For Maharashtra State** :-

Tender Enquiry No. SDGM(E)/98/MS/WE/06-07/1307 Dtd. 31/01/2007

Wind Energy Farm for Captive Use - 3.0 MW Capacity (Approx.)

Wind Energy Farm for Sale to Utility – 5.0 MW Capacity (Approx.)

Capacity of each Wind Mills should be (750 KW – 1250 KW)

2) **For Madhya Pradesh** :-

Tender Enquiry No. SDGM(E)/98/MP/WE/06-07/1310 Dtd.31/01/2007

Wind Energy Farm for Sale to Utility – 15.0 MW Capacity (Approx.)

Capacity of each machine should be (600 KW – 1000 KW)

Detailed information about Tender Notice & Tender Specification document are available in MOIL WEBSITE http:www.moilind.com. The tender documents can be obtained from the office of Sr.DGM (Elect. & PP) on payment of Rs. 10,000.00 in cash/DD in favour of Manganese Ore (India) Limited, payable at Nagpur, w.e.f. 07/02/07.

Last date for submission of bid is **28/02/2007** upto 15.00 Hours and Part-I shall be opened on the same day at 15.30 Hours.

Visit us at http/www.moilind.com

Sr.Dy.General Manager (Elect & PP)

MOIL ADDING STRENGTH TO STEEL

PART -A

SECTION 1

INTORDUCTION

1.1 Background

Manganese Ore (India) Ltd. (MOIL) A " Mini Ratna" public sector undertaking registered under companies Act 1956 and having its registered office at 3,mount road extension, Nagpur, is engaged in mining of manganese Ore and manufacturing of Manganese based products and Ferro Alloys. The company operates ten mines, six in Bhandara & Nagpur District of Maharastra state and four in Balaghat District of Madhya Pradesh State. The Company is leading producer of Manganese Ore contributing presently about 50 % of High grade ore production. High –grade ores are used in Ferro Manganese, chemical & battery manufacturing and low/medium grades ores finds application in Silico Manganese Production and other miscellaneous uses. The Company produces about 1.1 Million Tones of all grades of Manganese Ore and also manufactures 1,000 TPA Electrolytic Manganese Dioxide and 10,000 TPA Ferro Manganese.

1.1.1. MOIL INTENDS TO INSTALL THE WIND ENERGY FARM, APPROXIMATELY OF FOLLOWING CAPACITY IN MAHARASHTRA STATE

A) About 3.0 MW or Nearby Capacity wind power project for Captive Use

&

B) About 5.0 MW or Nearby Capacity wind power project for Sale to Utility.

TOTAL CAPACITY – 8.0 MW APPROXIMATELY

IN TENDER DOCUMENT, 8.0 MW SHALL BE MENTIONED EVERYWHERE WHICH SHALL BE DEEMED FOR BOTH PROJECTS AND, AFTER FINALIZATION OF TENDER SEPARATE ORDERS SHALL BE ISSUED FOR CAPTIVE USE & SALE TO UTILITY

1.1.2 In order to harness the wind energy potential in the Maharashtra State on commercial level and to boost the wind power generation in the state. MOIL has decided to set up a wind farm of 8.0 MW capacity with net minimum guaranteed generation for captive use & sale to utility respectively, through a single engineering procurement and construction (EPC) Contractor on turnkey basis. Responsibility of the operation and maintenance (O&M) of this wind power plant shall also be of the same EPC contractor. The capacity of the wind farm shall be in the range of (+) (-) 5%, depending on the number & size (capacity) of each WTG.

1.1.3 This document is request for proposal (RFP) from the potential manufacturers/suppliers of wind energy equipments for setting up of 8.0 MW or nearby capacity wind energy power plant at the (site to be selected and offered by

bidder) in the state of Maharashtra through a single EPC(BOT) cum (O&M) contractor. The EPC contractors shall also be responsible for the successful operation and maintenance of this wind power plant for 20 consecutive years.

1.1.4 The EPC (BOT) cum contractor shall be responsible for complete design engineering procurement erection testing and commissioning of the wind power plant. This would also include land, land acquisition, contour survey, micrositing arrangements of construction power and water facilities construction of suitable power evacuation facility and connection of the wind power plan with state grid at interconnection point as agreed by MEDA/MS TRANSCO/MSEDCL/MSEB, construction of internal wind farm roads controls room building and necessary approval required for commissioning of the projects etc .The scope of work for EPC contractor also includes operation and maintenance of the power plant including supply of consumable and spares wear and tear ,overhauling and replacement of damaged capacitor & other parts of WTG system for 20 years with no extra cost .the contractor has to guarantee minimum generation for 20 years.

SECTION 2

DEFINITION ABBREVIATION AND INTERPRETATIONS

2.1 Definitions and abbreviations

In the contract documents as herein defined where the context so admits the following
Words and expression will have the following meaning:

"Agreements" mean the EPC cum O&M contract including EPC part and O&M part

Alteration order shall mean an order given in writing by the engineer in charge of effect addition to or deletion from and alteration in the works.

" Bid tender " shall mean bid/ tender submitted by the contractor for acceptance by the owner.

"Bidder " shall mean the person or the person firm or company, consortium who has submitted their bid individually or jointly on consortium basis against this bid to Manganese Ore India Ltd Nagpur and includes the bidders legal representative his successors and permitted assignors.

"CEA" shall means central electricity authority a statutory body under the ministry of power, government of India.

"CEIG" shall mean Chief Electrical Inspectorate for Government of Maharashtra

"Commissioning certificate "shall mean the certificate to be issued by the engineer in charge appointed by the company. When contractor has completed all its contractual obligations.

"Contract" shall mean the agreement between the owner and the contractor for the execution of the work including therein all contract documents.

"Contract documents" shall mean collectively the NET Document, contract agreement and specifications. Annexure, appendix, agreed variations. If and, and such other documents consisting the bid and acceptance thereof.

"Contractor" shall mean the bidder selected to execute the contract pursuance to this bid.

" Construction equipment" shall mean all appliance and equipment of what so ever nature for the use in or for the execution completion operation or maintenance of the work unless intended to form part of the permanent work.

"Day" shall mean the 24 hours period beginning and ending at 12.00 midnight IST

"Drawings " shall include maps plan an tracing or prints thereof with any modification approved in writing by the engineer in charged and such other drawings as may from time to time, be furnished or approved in writing by the Engineer In-charge.

"DISCOM" shall mean company incorporated for the object of distribution of electricity in the state of Maharashtra.

"Effective Date" shall mean the date of issue of letter of intent first communication of acceptance of bid.

"Engineer In-Charge" shall mean the person designated as such by the Owner and shall included those, who are expressly authorized by the Owner, to act for and on his behalf for operation of this contract.

"EPC" shall mean Engineering, Procurement & Construction.

"EPC Contract Price" shall mean the price agreed between Bidder and the owner to complete the project as defined in Scope of work and including any other work required for completion of the project in all respect.

"GOI" shall mean Government of India and includes its legal representatives, successors & permitted assignees.

"GOMS" shall mean Government of Maharashtra and includes its legal representatives, successors & permitted assignees.

"Indian electricity (Supply) Act" shall mean Electricity Act 2003 and Indian Electric Rules 1956 and as amended from time to time.

"Interconnection Point" shall mean the physical point(s) at the terminal sub station, gantry (ies) where 11kV/33kV lines from the MSEB grid/DISCOM are connected.

"I.S." shall mean specifications of Bureau of Indian Standards (BIS).

"IITM" shall mean Indian Institute of Tropical Meteorology, Bangalore.

"IREDA" shall mean Indian Renewable Energy Development Agency", New Delhi.

"KW" shall mean Kilowatt.

"KWH" shall mean Kilowatt-hour.

"CMD" shall mean the Chairman Cum Managing Director of the Manganese Ore (India) Ltd, 3,mount road extension, Nagpur or his successor in office as designated by the Owner.

"MSEB" shall means Maharashtra State Electricity board.

"MERC" shall means Maharashtra Electricity Regulatory Commission

"MSEDCL" shall means Maharashtra State Electricity Distribution Co. Ltd.

"MNES" shall mean Ministry of Non-conventional Energy Sources, A Central Government, Ministry devoted to the cause of promoting non-conventional energy generation and use in India.

"Month" shall means a calendar month according to the Gregorian calendar beginning at 12.00 midnight from the last day of preceding month and ending at 12.0 midnight on the last day of that month.

"MW" shall mean Megawatt.

"Net Minimum Guarantee Generation" (NMGG) shall mean the minimum numbers of units (kWh) generated by the bidder to be fed to the grid from the wind power plant (combined generation of all WEG's) at export point i.e. state electricity board meter installed at wind farm site, after deducting power drawn from the grid for internal use of wind power plant which includes reactive power drawl required for WEG's if any (i.e. units exported-united imported)

"O & M" shall mean Operation & Maintenance of wind power project for 20 years.

"O&M Contract Price" shall mean the price agreed between Bidder and the owner for operation and maintenance of wind farm as a whole for a period of twenty years.

"Owner" shall mean Manganese Ore India Ltd, 3 Mount Road Extension, Nagpur Represented at the registered office of the company by the Chairman cum Managing Director or his authorized representative

"Project" shall mean the development, design & Engineering, Financing, manufacturing, delivery, construction, project management, commissioning, operation and maintenance of the proposed wind power generation facilities complete in all respects and all activities incidental thereto including PPA and other formalities for interfacing with the grid.

"REP" shall mean Request for Proposal.

"MOIL" shall mean Manganese Ore India Ltd registered under the Indian Companies Act 1956 with its principal office at Nagpur

"MEDA" shall mean Maharashtra Energy Development Authority.

"Site" shall mean the land and other places on through which work is to be carried out or any other lands or places approved for the purposes of the Contract together with any other place designated in the contract as forming part of the site.

"Specification" shall mean the various technical specifications attached and referred to in the bid document. It shall also include the latest edition including all appended corrigendum of relevant Indian Standard Published before entering into account.
"Sub-Contractor" shall mean any person or firm or company (other than the Contractor) to whom any part of the work has been entrusted by the Contractor, with the written consent of the owner.

"Transmission & Supply Agreement" shall mean the agreement to be signed for wheeling of power through MSEB/DISCOM grid.

"Work" shall mean the works to be executed in accordance with the contract or part thereof as the case may be and shall include all extra, additional, altered, or substituted works as required.

"WRAP" shall mean Wind Resource Development Programme, Bangalore.

"BOT" shall mean Build Operate and Transfer

2.2 Interpretations

The following interpretations are adopted in this bid.

(i) The headings and paragraph numbering are for convenience only.
(ii) The singular includes the plural and vice versa.
(iii) References to natural person include bodies, corporate and partnership.
(iv) References to any agreement, enactment, ordinance or regulation includes an amendment thereof or any replacement in whole or in part.
(v) References to Sections and Schedules are, unless the context otherwise required to section of and schedules to this bid.
(vi) The words proposal, Bid, tender and Offer shall have the same meaning.

SECTION - 3

INSTRUCTIONS TO BIDDER

3.1 The Bidder is advised to read carefully all instructions and conditions appearing in this document and understand them fully. He shall be deemed to have done so and satisfied himself when he submits his offer against this invitation to bid. All information required as per the bid document must be furnished and the appendix contained herein should be duly filled in. Failure to provide the information as required may render the bid technically unacceptable. The bid shall be submitted in English Language only.

3.2 BID DOCUMENT

3.2.1 Bidder shall sign each page of bid document as token of their acceptance of bid terms and conditions and submit the same with its proposal. Bid shall be prepared by typing or printing with indelible black ink on white paper consecutively numbered pages and each page signed.

3.2.2 All amendments/addendum/revisions to Bid documents issued subsequently by Owner if any, must be signed and submitted along with the bid and the bid submitted by the Bidder shall take into account all such amendments/addendum/revisions. The Bidder's are advised to submit the bid, strictly based on the terms and conditions and specifications contained in the documents. If acceptance of the terms and conditions given in the bid documents has any price implications, the same shall be considered and included in the price part. Owner can reject any or all offers without assigning any reasons whatsoever.

3.2.3 Bid documents are non-transferable.

3.3 Bid Submission

3.3.1 Bid shall be prepared and submitted in sealed envelope with description of the work, and last date of receipt of bid super scribed thereon and with the note "**- DO NOT OPEN –before…(**date of bid opening)" written prominently. The full name, postal address, telegraphic address and telephone/fax no., of the Bidder shall be written on the bottom left corner of the sealed cover.

Bid must be submitted by the time and date mentioned in the letter of invitation of bid. Bid received after the time & date fixed for receipts of offer are liable for rejection.

The bids so submitted shall be in two separate sealed envelopes in two parts as follows:

a) **PART – I TECHNICAL & COMMERCIAL BID.**

Containing un-priced complete technical package including drawings & documents and all commercial terms & conditions along with blank price format. The bid document duly signed on all pages in token of acceptance should be enclosed. One original and 2(Two) copies shall be submitted in a sealed envelope. This sealed envelope should be super scribed with date of opening & nature of work and part I – Technical and Commercial Bid.

b) **PART – II PRICE BID**

i) The PART-II (Price Part) of offer should be packed in second envelope and should contain the PRICE only. This sealed envelope should be super scribed Part II **"Price Offer"** with nature of work No commercial/general conditions to be included in the PART-II. Any such condition if appearing will not be evaluated and the same will be ignored.

ii) Detailed Price Break-up the price bid shall contain prices strictly as per price format with detailed break-up as per proforma enclosed at Appendixes both in figures & words.

iii) Operation & Maintenance charges per unit basis for 8.0 MW or nearby capacity wind farm for Twenty consecutive years including cost of consumables, spares, wear and tear overhauling charge replacement of capacitors, any other parts of WEG and complete insurance of the Wind Farm.

3.3.2 Insertion, postscript, addition and alteration shall not be recognized unless confirmed by the Bidders signature.

3.3.3 All the copies of bid should be complete in all respect with all their attachments/enclosures.

3.3.4 The Earnest Money Deposit should be placed, in the Third Envelop clearly super scribed "EMD" on top right corner. Please note that proposal shall be opened only upon receipt of prescribed EMD.

3.3.5 A set of Part I and Part II above may be sealed in two separate covers and on top of each cover the correct Part No. And respective title as per clause no. 3.3.1 above must be indicated. These together with EMD envelope should be put in one cover envelope and sealed and on top of which should be super scribed **"BID DATE AND TIME OF OPENING AND DESCRIPTION".** The cover should be sufficiently large to enable it to be opened without tearing the inner sealed cover and should bear only the address of Manganese Ore India Ltd 3, Mount Road Extension, Nagpur.

3.3.6 If the cover of the offer is not sealed and marked as required, MOIL will assume no responsibility for the bids misplacement or premature opening.

3.5.5. Any neglect or omission or failure on the part of the Bidder in obtaining necessary and reliable information upon the forgoing or any other matter affecting the bid shall not relieve him from any risks or liabilities or the entire responsibility for completion of the work in accordance with the bid documents.

3.5.6 Validity of Bid – the bid shall remain valid for the period of 120 days from the opening of part I

3.6 Examination of Bid Document

3.6.1 The Bidder is required to carefully examine the Technical Specification, terms and Conditions of Contract, and other details relating to supplies as given in the Bid Document.

3.6.2 The Bidder shall be deemed to have examined the bid document to obtain information on all matters whatsoever that might affect to carrying out the manufacture & supplier activity and to have satisfied himself as to the adequacy of his bid. He is deemed to have known the scope, nature and magnitude of the supplies and the requirements of material and labor involved etc. and as to all supplies he has to complete in accordance with the Contract.

3.6.3 Bidder is advised to submit the bid on the basis of conditions stipulated in the bid document. Should it, however, becomes totally unavoidable the Bidder should propose any addition/deviation/alterations to any of the terms and conditions contained in these document, the same must be expressed clearly in the bid, without making any corrections on the body of the bid documents, in the absence of which it will be deemed as acceptance by the Bidder of all terms and conditions contained herein. Bidder's standard terms and conditions will not be considered. MOIL reserves the right to evaluate the offer containing deviations in the manner it deemed fit.

3.6.4 The cancellation/alteration/amendment/modification of any documents such as Power of Attorney, Partnership Deed, Memorandum and Articles of Association, etc. should be communicated by the Bidder to MOIL in writing well in time, failing which MOIL shall have no responsibility or liability for any action taken on the strength of the said documents.

3.6.5 Bidder should indicate in his offer, if its Proprietor or Partners or Partners of Directors or any of their relatives (as specified in section 6 of the Companies Act, 1956) are employed in MOIL, failing which the offer may be disqualified or if such fact subsequently comes to light, MOIL reserves the right to take any other action as deemed fit in accordance with any applicable law. Rules, Regulations for the time being in force.

3.6.6 Bid not submitted as per the instructions are liable to be rejected. Bid shall confirm in all respects with requirements and conditions referred in this bid document.

3.7 EARNEST MONEY

3.7.1 The Bidder shall furnish, as part of its bid, the Interest free Earnest Money Deposit in favor of Manganese Ore (India) Ltd in the following mode:

Rs. 15 lacs & Rs. 25.00 Lacs (Total Rs. 40.00 Lacs) in the form of Demand Draft in favor of "Manganese Ore (India) Ltd " payable at Nagpur

OR

Irrevocable bank guarantee for Rs. 15 lacs & Rs. 25.00 Lacs (Total of Rs. 40.00 Lacs) from scheduled bank valid upto 28 days beyond the validity of bid**.**

The Earnest Money Deposit for the unsuccessful Bidders will be discharged/refunded on finalization of order or expiry of the validity of offer, which ever is earlier

3.7.2 The Earnest Money Deposit shall be forfeited without prejudice to his being liable for any further loss or damage incurred on consequence by the owner.

a) If a Bidder withdraws its bid during the period of bid validity specified in the bid document or
b) In case of successful Bidder, if the Bidder fails :
   - to sign the Contract: or
   - to submit the Performance Guarantee specified in the bid document.

3.7.3 Earnest Money of successful Bidder may be converted into the Security Deposit, which shall be returned after six month of successful commissioning of the Wind Power Plant.

3.8 ORGANIZATION

3.8.1 In case the Bidder is a Partnership firm, certified copy of the partnership deed together with a certified extract from the registrar of firms containing names & addresses of all the partners of the firm should be furnished along with the offer.

3.8.2 In case of Company (whether private or public), certified copy of the "Certificate of Incorporation" together with certified Memorandum and Articles of Association & a list containing names & address of all Directors should accompany the offer.

3.8.3 In case of Proprietorship Firm, the name & address of Proprietor should be furnished.

3.8.4 In case of consortium the lead/major/minor partner of the consortium shall be identified clearly. The roles and responsibility of the entire consortium partner shall be identified and indicated in clear terms. The bidder shall submit the original copy of the agreement executed in legally bound manner stating the responsibility of all the members of consortium. Please note that the lead and

major members of the consortia shall be liable jointly and severally for successful completion of the contract.

3.9 No Compensation for Submission of Bid

The Bidder whose bid is not accepted shall not be entitled to claim any costs, charges and expenses of and incidental to or incurred by him through or in connection with his submission of bid even though the Owner may elect to modify/withdraw the invitation of Bid.

3.10 Rights of MOIL

3.10.1 MOIL reserves its right to accept or reject any bid, or to annual the bidding process and reject all bids any time prior to the award of Contracts, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Moil's action.

3.10.2 The bid documents shall be issued only to prima fascia qualifying parties after scrutiny of the documents furnished by intending parties along with their request for issue of bid document. However, such issue of bid document will not automatically construe that the bidder are considered qualified. Such qualification can be reviewed at the time of evaluation.

3.10.3 MOIL reserves its right to vary, modify, revise, amend or change any of the terms and conditions of the Bid.

3.10.4 The decision regarding acceptance of bid by MOIL will be full and final.

3.10.5 MOIL is free to phase out the work if it feels it necessary.

3.10.6 The decision taken by the MOIL in the process of Bid evaluation will be full and final, MOIL is the final decision-making authority as far as the present bid for EPC(BOT) cum O&M of 8.0 MW or nearby capacity Wind Power Project is concerned.

3.11 CLARIFICATIONS/AMENDMENTS BY MOIL

3.11.1 MOIL may issue clarifications/amendments in the form of addendum/corrigendum during the bidding period and may also issue amendments subsequent to receiving the offers. For the addendum/corrigendum issued during the bidding period. Bidder shall confirm their impact, in the bid. For clarifications issued by MOIL subsequent to receiving offers, the Bidder shall confirm receipt and for any impact on the quoted prices, the bidder shall follow the instructions issued along with addendum/corrigendum.

3.11.2 Bidder shall examine the documents thoroughly and submit to MOIL any apparent conflict, discrepancy or error, MOIL shall issue any appropriate clarification or amendment. Any failure by Bidder to comply with the aforesaid shall not excuse the Bidder, if subsequently awarded the contract, from performing the service in accordance with the agreement.

3.11.3 MOIL reserves the right to review/evaluate and makes their own assessment of the offers in its entirety and seeks more clarifications/information with reference to all or any other information/documents submitted.

3.11.4 Bidder shall be prepared to furnish clarification/information, if asked for and attend discussions, as required by MOIL at short notices. Bid from those bidders

who fail to turn up for discussion or furnish the required clarifications called for by MOIL to his satisfaction may not be considered.

3.12 **CONFIDENTIALITY OF DOCUMENTS**

Bidder shall treat bid documents and contents therein private and confidential. If at any time, during the bid preparation period, the Bidder decides to decline to offer, all documents must be immediately returned.

3.12 **LANGUAGE**

The bid including all drawing, documents, catalogues shall be submitted in English Language.

3.14 **PART-I, TECHNO-COMMERCIAL BID WILL CONSIST OF THE FOLLOWING :**

3.14.1 Letter regarding submission of bid along with following enclosures in the sequence given herein below and in case any particular item is not enclosed, it shall be marked as "NOT SUBMITTED" in the list of enclosure to the Covering Letter.

a) EARNEST MONEY DEPOSIT
An interest free earnest money deposit as defined in para 3.7 must accompany the bid.

b) POWER OF ATTORNEY.
Power of Attorney/Authorization with the seal of the company of person signing the documents.

c) Time Schedule
Detailed time schedule indicating various activities which Bidder proposes to complete within the time of completion of work in the form of PERT Chart with definable mile-stones taking into account the scope of work of his various Sub-Contractors.

d) Financial & Technical Parameters of the Organization.
- i) Audited Balance Sheet including profit and loss account by Chartered Accountant (CA) of last three years.
- ii) Net worth certificate.
- iii) The details of the technical staff available with their experience in the area of Wind Energy projects.
- iv) Evidence of adequacy of working capital limits form scheduled bank.
- v) Solvency certificate for a minimum of 25.0 cores from any scheduled bank

e) Sales Tax and Income Clearance Certificate/returns
Latest Sales Tax and Income Tax clearance certificate/return .

f) EXPERIENCE OF WORKS OF SIMILAR NATURE & MAGNITUDE.
Details of work of similar nature and magnitude carried out/being carried out, in the state of Madhya Pradesh, by the Bidder during last 3 financial years. In addition, performance report of WEG)s) installed along with generation achieved against and minimum guaranteed generation from various Clients, for whom the Bidder had carried out work of similar nature and magnitude, shall be enclosed along with following details .

i) Work order copies.
ii) Certified copies of plant acceptance certificate issued by client.

g) SPECIAL TOOLS AND TACKLES
An un-pricded list of recommended special tools and tackles, instruments and appliances for operation and maintenance of equipment and system for contracted period.

h) GUARANTEED TECHNICAL PARTICULARS TO BE FURNISHED BY THE BIDDER.

i) The Technical particulars of WEG(s) offered in the Bid.
ii) The Technical particulars of step up transformer offered in the bid.
iii) The technical particulars of 33 kV Switchgear Kiosk offered in the bid.
iv) Certified Power Curve of offered WEG.
v) Power evacuation system.
vi) Year Wise Guaranteed Energy Generation.
vii) Minimum guaranteed generation at the electricity board meter (export point) installed at wind farm site
Bidder shall guarantee towards generation of _____ lacs units for the wind farm per year at the electricity board meter (export point) installed at wind farm site on an average basis for block period of 2 years upto 20 years. The generation guarantee shall start 30 days after the commissioning /stabilization of the project satisfactorily with respect to Grid
Any short fall in guaranteed generation shall be compensated to MOIL at the end of each block of second year as per prevailing rate of Electricity Board applicable to Mines for captive use & prevailing rate of MERC for Sale to Utility.
viii) Drawl of Reactive power from Grid should not be more than 1% with out adding extra quantity of capacitor bank as permissible by IE Rule 1956 (ie 30% of generated capacity). Any quantity over and above 1% shall be recovered from the contractor at the prevailing rate of MSEB/MERC**.**

i) ORGANIZATION CHART/SET-UP.

Organization chart of the Bidder proposed for aforementioned scope of work at site.

Details of specialists' manpower available with the Company or their associates. The details of manpower to be deployed for O&M of Wind Farm.

p) QUALITY ASSURANCE PLAN.

Quality Assurance Plan of Bidder's Organization.

q) **LITIGATION HISTORY.**

The Bidder's should provide accurate information on any litigation or arbitration resulting from Contract completed or under execution by him over the last three years. A consistent history of awards against the applicant may result in failure of Bidder.

r) **DEVIATIONS/EXCEPTION, IF ANY**.

If the Bidder proposes deviations from the bid documents such deviations shall be kept to the minimum and shall be underlined/highlighted. Bidder shall also summarize such deviations with cross-reference to the main bid documents in a separate document.

The Bidder should confirm that they have not been banned or delisted by any Govt. or Quasi-Govt. Agencies or PSU's. If so banned this fact must be clearly stated by Bidder in his offer. However, it may not necessarily be a cause of disqualifying the bid. If this declaration is not given, bid will be rejected as non-reponsive.

3.15.1 EVALUATION OF BIDS.

The evaluation of bids shall be based upon the following :

1) EPC Contract Price
2) O & M Cost including insurance.
3) Year Wise Minimum Guaranteed Generation.
4) Post Generation Data of site and WEG(s) offered by the bidder.
5) Experience of the bidder in Madhya Pradesh
6) Financial and technical capability.
7) Manufacturing and maintenance capability
8) Technology of WEG offered

The above-mentioned points are just the guidelines but the bid evaluation is not restricted to it. Any other point relevant with the evaluation of the bid shall also be considered for evaluation.

PREFERENCE SHALL BE GIVEN TO WEGS WITH FOLLOWING FEATURES

1) WEGs capable of exporting Reactive Power without the use of capacitor Banks.
2) WEGs with minimum consumption Drawl of Reactive (RKVAH) from the Electrical Grid
3) WEGs with Lowest Cut- in Wind Speed at which Generation starts
4) WEGs with Grid Frequency Compatibility
5) WEGs with 3 independent braking Systems.
6) WEGs with Variable Speed and Continuous Pitch Regulation.
7) WEGs with Synchronous Generation
8) WEGs with Comprehensive Lightning Protection including Blades.
9) WEGs installed on Tubular Towers
10) WEGs with highest machine availability

General Requirements.

1. Bidder should provide evidence for the land in its possession on which the proposed Wind Power Project shall be established.
2. Bidder shall indicate the minimum guaranteed Generation for the wind farm for at least two years.
3. Bidder should be ready to sign a comprehensive operation and maintenance contract covering the cost of repair/replacement of blades in case of damages of blades caused due to lightning .the operation and maintenance for a period of ten years form the date of commissioning.

3.16 QUALIFYING REQUIREMENTS.

The following are the qualifying requirements for the Bidder. Bids that do not meet the listed requirements/non submission of the documents may not be considered for technical and commercial evaluation.

(i) Must have an experience of installing and successful operation of at least 50 MW aggregate capacity wind power plants in last three years. However, preference shall be given to those having experience in Maharashtra State.

(ii) Individual WEGs offered under this Bid must be in the range of 750 kW to 1250 KW of proven design.

(iii) The WEG offered should have valid type test certification and certified power curve from RISO Denmark/Devi-Germany Germanischer LLOYD-Germany/C-WET or any approved international agency. Certified copies of above documents shall be enclosed.

(iv) Earnest Money Deposit (EMD) as specified.

(v) Documentary evidence for sound financial net worth of minimum Rs. 25 cores in last/current financial year.

3.17 DEVIATION/EXCEPTIONS.

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3.17.1 No deviations or exceptions to MOIL's terms and conditions and/or pricing requirements will be accepted. Bidder may make due allowance in his prices for compliance with the terms and conditions contained herein. However any deviation/exception from bid specifications; bid terms & conditions contained herein shall be clearly defined with reasons elaborated.

3.17.2 Deviation/exception not indicated separately deemed to have agreed with the terms and condition of the bid document.

3.18 BID REQUIREMENTS

The Bidder shall have technical, financial & legal expertise to carry out the assignment and be fully conversant with prevailing laws and regulations of the Govt. of India and Govt. of Maharashtra for setting up of the wind power projects.

3.19 AWARD OF WORK

3.19.1 The Bidder, whose bid is accepted by owner shall be issued Letter of intent, prior to expiry of bid validity, Subsequently, detailed work order will be issued to the successful Bidder.

3.19.2 MOIL shall not be obliged to furnish any information clarification explanation to the unsuccessful Bidders as regards non-acceptance of their bids. Except for refund of EMD to unsuccessful Bidders. MOIL shall correspond only with the successful Bidders.

3.19.3 Contract agreement.

On receipt of LOI/LOA issued by the company for acceptance of the tender ,the successful tenderer shall sign the agreement for the due fulfillment of the contract, in the enclosed Proforma in non judicial stamp paper with in ten day s of receipt of advice

3.20 PRICE

3.20.1 The Bidder shall quote the price for turn key project including land and its acquisition, permission, approvals, power evacuation system, design, engineering, manufacturing, supply, handling storage, civil works, erection, testing & commissioning or any other activity required for commissioning of the plant along with O&M charges per unit basis of the project as per the Price scheduled. It shall include all the taxes, duties, cess and comprehensive insurance charges (for 20 years) etc. The break up of the total bid price shall be indicated.

3.20.2 The bidder shall not separately bill any accessories and items required for making the WEGs machinery workable and their price will be deemed to be included in the quoted price of WEGs. The price shall include all the expenses incurred as Fee and other charges required for application/approval export power to the DISCOM grid.

3.20.3 Prices for land, supply, erection and civil engineering work shall be inclusive of all applicable taxes and duties.

3.20.4 The price as stated above shall remain firm and not subject to any variations till completion of entire scope of work as per Bidder's scope,

3.20.5 The rate shall be written in English both in words and in figures, Corrections, if any, shall be made by crossing out, initialing, dating & rewriting. In case of discrepancies between the figures and words in the rates, the later shall prevail.

3.21 TAXES & DUTIES.

The quoted price shall be inclusive of all taxes, duties, levies etc. In case of failure by the Contractor to include any taxes, duties and levies in the quoted price, the Owner shall not entertain any claim later on whatsoever on this account.

3.22 COMPLETION TIME.

3.22.1 The Bidder shall complete the design, engineering, manufacture, supply, storage, civil work, erection, testing & commissioning of WEGs & other Equipment within **Three months** of placement of order.

3.22.2 The Bidder shall indicate the duration of all the activities in a PERT Chart in conformity to the overall schedule of the completion of project. This PERT Chart shall be discussed and finalized and shall form an integral part of the Contract which shall be used for application of L.D./Penalty as per special condition of bid.

3.23 RECEIPT OF BID PROPOSAL

The Bidder has the option of sending the bid by Courier Service/Registered Post or submitting in person, so as to reach the bid, given in the invitation to bid on or before the date and time set out for the same. Bid submitted by TELEX, FAX, E-

Mail or by any other electronic media will not be accepted. MOIL shall not be responsible for postal delay either while receipt of bid document by the Bidder or submission of offer by them.

3.24 **TRANSFER OF BID DOCUMENT/BID**

Transfer of bid documents is not permissible. Similarly transfer of bid submitted by one Bidder to another is not permissible.

3.25 SECURITY DEPOSIT.

The successful tenderer shall submit the security deposit of 5 %(five percent) only of the contract value within 7 days after signing of contract in the form of Bank Guarantee form a scheduled bank in favor of MOIL and the same shall remain at the disposal of the company as security till the satisfactory execution & completion of the work in accordance with the provision of the contract. The bank guarantee shall be submitted in the schedule perfoma (furnished elsewhere in the TDS) on appropriate stamp paper valid upto final acceptance and issue of successful commissioning of certificate. On receipt of security deposited in the form of bank Guarantee the earnest money deposited earlier shall be refunded to the successful tenderer.

Security deposited will be returned to the contractor after successful completion of final acceptance and issue of successful commissioning of certificate and acceptance there of by MOIL. Bank guarantee will be extended by the contractor, if completion of the work delayed for any reason whatsoever.

3.26 FINAL TESTING AND COMMISSIONING

Final acceptance test for performance guarantee of the wind power project will be conduced for 30 days. The details and norms of the final testing shall be mutually finalized by the successful tenderer and MOIL.

Test of wind power project will be conducted for their capacity /parameters fulfilling all guarantees as mutually decided with successful tenderer and approved by the company.

If there is no deficiency, the company will issue a certificate of final acceptance /satisfactory commissioning of the plant.

3.27 DEDUCTION AT SOURCE.

Notwithstanding anything contained elsewhere in the Contract, the Owner shall deduct at source from the payment due to the Contractor all taxes as required under the Law for the time being in force. The Owner shall pay the amount so

deducted to the Authorities concerned as per Law. The Owner shall, however, provide with tax deduction certificate evidencing such tax payments. This is for the Contractor to deal with

Tax Authorities directly in respect of any claim or refund relating to the above and the Owner shall not be liable or responsible for any type for payment or reimbursement in this regard.

3.28 PAYMENT PROCEDURE

3.28.1 The contractor shall submit the bills for claim in three copies. The payment shall be made after the verification and recommendation for payment from the Engineer In-charge.

3.28.2 It is expressly understood that the drawl of payment by the Contractor in the manner specified will not be construed as the fulfillment of the contractor's obligations either in part or whole under the contract and that the contractor shall continue to remain responsible to owner until all the obligations under the agreement have been fulfilled.

3.29 TERMS OF PAYMENT

Subject to any deduction which the Owner may be authorized to make the Contract Price terms of payment regarding EPC and O & M works of the project shall be as under :-

(i) 10% of EPC price shall be released as mobilization advance against bank guarantee from any scheduled Bank

(ii) 80% of EPC price shall be released after installation commissioning of wind power project. After issue of successful installation and commissioning certificate by Engineer –in charge

(iii) 10% of EPC price shall be released after two years successful operation and maintenance of the project.

(iv) The payment of O & M charges shall be paid on yearly basis after adjustment of dues payable to MOIL.O&M charges shall start after 2 years successful operation and maintains of the project The Owner will be billed by the Contractor following the end of each year of O & M period. The payment of undisputed amount will be made within 30 days from the date of receipt of invoice against O & M of power plant.

3.30 contractor shall submit performance bank guarantee equivalent to total yearly O&M charges. The performance guarantee shall be renewable after every year till the completion of O&M period 20 years .

3.31 **LIQUIDATED DAMAGES FOR DELAY IN COMPLETION.**

If the contractor fails to complete the total installation and commissioning of the wind farm within the stipulated period as specified in clause No 4.4 liquidated damages @ 0.5% of the EPC contract price for every week and part there of delay up to a maximum of 10% shall be levied.

3.32 TERMINATION, SUSPENSION, CANCELLATION & FORCE – CLOSURE OF CONTRACT

3.32.1 The company shall in addition to other remedial steps to be taken as provided in the conditions of contract be entitled to cancel the contract in full or in part, without and liability to the company, if the contractor:

3.32.2 Makes default in proceeding with the works with due diligence and continues to do so even after a notice in writing form the engineer in charge, then on the expiry of the period as specified in the notice.

3.32.3 Commits defaults or breach in complying with any of the terms and condition of the contracts and does not remedy it or fails to take effective steps for the remedy to the satisfaction of the engineer in charge then on the expiry of the period as may be specified by the engineer in charge in a notice in writing.

Or

3.32.4 Fails to complete the work or items of work with individual dates of completion on or before the date(s) of completion or as extended by the company then on the expiry of the period as may be specified by the engineer in charge in a notice in writing.

Or

3.32.5 Shall offer or give or agree to give any person in the service of the company or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for act/(s) of favor in relation to the obtaining or execution of this or any other contract for the company.

Or

3.32.6 Obtains a contract with the company as a result of ring tendering or other non-bonafide methods of competitive tendering.

Or

3.32.7 Transfers, sublets, assign the entire work or any portion thereof without the prior approval in writing from the engineer-in-charge. The engineer-in-charge may by giving a written notice, cancel the whole contract or portion of it in default.

3.32.8 The contract shall stand terminated under the following circumstances:

3.32.9 If the contractor being an individual in the case of proprietary concern or in the case of a partnership firm any of its partners is declared insolvent under the provisions of insolvency acts for the time being in force or makes any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors amounting to proceedings for liquidation or composition under any insolvency act.

3.32.10 In case of the contractor being a company, its affairs are under liquidation either by a resolution passed by the company or by an order of court, not being a

voluntary liquidation proceedings for the purpose of amalgamation or reorganization or a receiver or manager is appointed by the court on the application by the debenture holders of the company, if any

3.32.11 If the contractor shall suffer an execution being levied on his/their goods estates and allow it to be continued for a period of 21 days.

3.32.12 On the death of the contractor being a proprietary concern or of any of the partners in the case of a partnership concern and the company is not satisfied the t legal representative of the deceased proprietor or the other surviving partners of the partnership concern are capable of carrying out and completing the contract. The decision of the company in this respect shall be final and binding which is to be intimated in writing to the legal representative or to the partnership concern.

3.32.13 On cancellation of the contract or on termination of the contract the engineer-in-charge shall have powers.

3.32.14 To take possession of the site and any materials, construction plant, implements, store, etc. thereon.

3.32.15 To carry out the incomplete work by any means at the risk of the contractor.

3.32.16 To determine the amount to be recovered from the contractor for completing the remaining work or in the event the remaining work is not to be completed the loss/damage suffered, if any , by the company after giving credit for the value of the work executed by the contractor upto the time of cancellation less an a/c payments made till date and value of contractor's material, plant, equipment , etc. taken possession of after cancellation.

3.32.17 To recover the amount determined as above, if any from any money due to the contractor on any account or under any other contract an in the event of any shortfall, the contractor shall be called upon to pay the same on demand.

The need for determination of the amount of recovery of any extra cost/expenditure or any loss/ damage suffered by the company shall not however arise in the case of termination of the contract for death/demise of the contractor as stated in 3.32.12

3.32.18 SUSPENSION OF WORK

The company shall have power to suspend the progress of the work or any part thereof and the engineer-in charge may direct the contractor in writing to suspend the work, for such period and in such manner as many be specified therein, on account of any default on the part of the contractor, or for proper execution of the work for reasons other than any default on the part of the contractor, or on ground of safety of the work or part thereof. In the event of suspension for reasons other than any default on the part of the contractor, the company shall allow extension of times equal to the period of such suspension.

3.32.19 FORECLOSURE OF CONTRACT IN FULL OR IN PART

If any time after acceptance of the tender, the company decide to abandon or reduce the scope of the work for any reason whatsoever the company through its engineer-in-charge shall give notice in writing to that effect to the contractor. In the event of abandonment/reduction in the scope of work, the company shall be liable.

3.32.20 To pay the contractor at the contract rates full amount for works executed and measured at site up to the date of such a abandonment/reduction in the work.

3.32.21 To pay reasonable amount assessed and certified by the Engineer-in charge of the expenditure incurred, if any, by the contractor on preliminary work at sit e.g. temporary access roads, temporary construction for labour and stall quarters, office accommodation, storage or materials, water storage tanks and supply for the work including supply to labour/Staff quarters, office etc

3.32.22 To pay for the materials brought to site or to be delivered at site, which the contractor is legally liable to pay for the purpose of consumption in works carried out or were to be carried out but for the foreclosure, including the cost of purchase and transportation and cost of delivery of such materials. The materials to be taken over at its discretion the contractor to retain the material in full or in part if so desired by him and to be transported by the contractor from site to his place.

3.32.23 To take back the material issued by the company by remaining unused, if any, in the work on the date of abandonment/reduction in the work at the original issue price less allowance for any deterioration or damage caused while in custody of the contractor.

3.32.24 To pay for the transportation of tools and plants of the contractor form site to contractor ‘s place or to any other destination, whichever is less.

The contractor shall, if required by the engineer-in-charge furnish to him books of account, paper, relevant documents as may be necessary to enable the engineer-in-charge to access the amounts payable in terms of Para 3.32.21,3.32.22.and 3.32.24 above. The contractor shall not have any claim for compensation whatsoever either for abandoned or for reduction in the scope of work, other than those as specified above.

3.33 FORCE MAJEURE

3.33.1 Neither MOIL nor the contractor shall be liable to each other for nay delay in or failure of their respective obligation by occurrence of any event beyond the control of MOIL or contractor (as the case may be) on account of breakdown in power supply, fire, floods, earth quakes, acts of the public enemy, wars, insurrection, riots, strikes, lock –outs, thefts and damages, any law statutes or ordinance order, action of regulation of the government or any compliance therewith similar to the above and any other. Either party shall promptly, but not later that thirty (30) days thereafter, notify the order of the commencement and cessation of such contingency and approve that such is beyond the control and affects the implementation of this tender adversely and id such contingency continued beyond six (6) months both parties agree to discuss and agree upon an equitable solution for termination of the contract or otherwise decide the course of action to be adopted mutually..

3.33.2 The respective obligation of parties shall be extended for the period of Force majeure provided notice as required above are give in time and the contingency established if so required by the other party.

3.34 SETTLEMENT OF DISPUTES/ARBITRATION

3.34.1 It is incumbent upon the contractor to avoid litigation and disputes during the course of execution. However, if such disputes take place between the contractor and the departments, effort shall be made first to settle the dispute through committees at different levels made for this purpose by the company.

The contractor should make request in writing to the engineer-in-charge for settlement of such disputes/claim failing which no disputes/claims of the contractor shall be entertained by the company. If difference still persist the contractor may request in writing to the Engineer-in charge for referring the matter to a sole arbitrator. Such request shall be made by the contractor within90 (ninety) days of receiving the intimation from the engineer-in –charge about the final decision of the above committees in regards to the disputes/claims failing which the claim(s), difference(s) or dispute of the contractor will be deemed to have been waived and the company shall be released and discharged of all liabilities under this contract in respect of this claims. However, it is the prerogative of the company to accede to the request of the contractor for appointment of a sole arbitration.

3.34.2 Disputes between the Department and the Contractor shall first be submitted to conciliation. The procedure outlined in the Arbitration and Conciliation Act, 1996 shall be followed.

3.34.3 Case(s) against MOIL, if at all, shall always be filed only in the court situated at Nagpur, Maharastra.

3.34 Correspondence

All information, correction letters & details accompanying the bid document and all further correspondence in connection with the bid shall be addressed to :-

Sr. DY GENERAL MANAGER (Elect&PP)
Manganese Ore (India)Ltd
West court , Kotol road
Nagpur
Ph (0712) 2591241
(M) 9860093554
Fax (0712) 2591113,2592272

Section – 4

SPECIAL CONDITIONS OF CONTRACT

4.1 Contract Price

The total price for the project is in accordance with all terms, conditions, stipulations, specifications, requirements and other conditions of the Contract as accepted by the Owner and incorporated into the Contract document, shall be treated as the Contract price.

4.2 EPC CONTRACT PRICE

4.2.1 The EPC Contract price shall be deemed inter-alia to included entire scope of work and cover the cost of land, equipment, materials and supplies, tools, consumable, transport, handling, approval, checking & testing, power evacuation facility up to MSEB Grid., stores appliances, insurance & safety by the Contractor, free operation and maintaninance for 2 years and all other materials in connection with the execution of the supplies or any portion thereof complete in every respect or as may be ordered in writing during the tenure of Contract.

4.2.2 The EPC (BOT) Contract is on lump sum turnkey basis and the contractor is responsible for the total scope of work starting from design & manufacture till the project is successfully commissioned.

4.2.3 The EPC Contract price shall be inclusive of all taxes and duties.

4.2.4 Prices for O & M after initial free operation and maintenance of 2 years shall be specified separately for entire O&M period of 20 years.

4.3 O & M CONTRACT PRICE

4.3.1 The price agreed between the successful Bidder and the owner for operation & maintenance of wind farm as a whole including wear, tear, overhauling, machine break down, replacement of defective capacitors and any other parts of WEG system for a period of twenty years shall be treated as O&M Contract Price.

4.3.2 The O&M Contract Price shall be deemed inter alia to include entire scope of work and cover the cost of all consumables, deployment of manpower & spares, insurance or any other activity during O&M period of twenty years.

4.3.3 The O&M Contract Price shall remain firm & fixed and binding till completion of O&M period i.e. twenty years from date of completion of two years after successful installation and commissioning of wind power project.. No escalation

will be granted on any reason whatsoever, unless otherwise provided in the contract.

4.4 COMPLETION PERIOD

4.5.1 Time is the essence of contract. The wind farm project shall be totally completed & commissioned within three month from date of placement of order.

4.5.2 The project will be considered commissioned and complete after successful running of WEG(s) on continuous generation of electricity for 30days.

4.5 WARRANTY AND GUARANTEE

4.5.1 **WARRANTY FOR WIND POWER PROJECT.**

The equipment's offered shall be under warranty for guaranteed performance in the contracted period of two years after successful commissioning of wind prower project. The Contractor shall also guarantee that the equipment offered is of current design and incorporate all recent improvements in the design.

4.5.2 PERFORMANCE GUARANTEE.

If the actual generation during any year of O & M period is less than the generation guaranteed by the bidder in the bid the contractor shall be liable to pay penalty of the per unit electricity charges payable to MOIL by MSEB at prevailing rate applicable as per order of MERC, for respective year for Sale to Utility & for Captive use the prevailing rate payable to MSEB by MOIL, shall be recoverable from their due payment of (O&M) charges and/or suppliers credit payment due (Principle or interest or both) and/or outstanding contractor's credit amount.

4.5.3 It is the responsibility of the O&M contractor to maintain high power factor to reduce VAR drawl in these system. If MSEB penalize MOIL for lower power factor/VAR drawl from the grid, penalty at actual amount shall be deducted from the O&M contractor bills/outstanding contractor's credit amount.

Drawl of Reactive power from Grid should not be more than 1% with out adding extra quantity of capacitor bank as permissible by IE Rule 1956 (i.e. 30% of generated capacity). Any quantity over and above 1% shall be recovered from the contractor at the prevailing rate of MSEB

4.6 CONTRACTORS OBLIGATION

4.6.1 The Contractor shall complete the project in all respect as per the Contract including power evacuation facility and necessary approval and formalities

including power Purchase Agreement; MOIL shall not pay any extra cost for the same.

4.6.2 The Contractor shall guarantee " Minimum Guaranteed Generation" of electricity, at export point, for 20 years of operation & maintenance and hand over to MOIL the wind farm in good condition at the end of twenty years of O&M period.

4.6.3 The Contractor shall deemed to have satisfied himself on and taken account of :-

(i) All conditions and circumstances affecting the contract.
(ii) Carrying out the work as described in the contract.
(iii) General circumstances at site.
(iv) General labour position at site etc.
(v) Scope of work as per bid document.

4.6.4 The contractor shall arrange on his own cost, power, water or other items required at site.

4.6.5 The Contractor shall be responsible for obtaining all licenses, permits and approvals for input of equipment. The owner may if requested in writing by contractor, provide reasonable assistance in obtaining necessary clearance/approvals.

4.6.6 The Contractor shall coordinate with MSEB/MERC for timely completions of inter connection, protection scheme and providing the same including the mattering facility as required.

4.6.7 The Contractor shall provide access to the officials of Govt.of MS/MOIL/MSEB/MERC/MEDA or any other nominated agencies required for project facilities at all, in reasonable time during construction and operation phase and during O&M contract period.

4.6.8 The EPC cum O&M contractor shall be responsible for safe and uninterrupted operation of the plant including undertaking planned maintenance programme.

4.6.9 The contractor shall also provide all data, wind data, documents and information to MOIL/Govt.of MS/ /MSEB/MERC/MEDA and its nominee as desired during erection, operation and maintenance period.

4.6.10 The contractor shall ensure comprehensive insurance e of the complete plant for the period of 2+18(two plus eighteen) years from the date of successful commissioning of plant at the cost of the Owner. the cost of insurance shall be reimbursed on production of proof of payment. He shall quardinate with insurance authorities in settlement of the claim if any during the above period.

4.6.11 The contractor shall submit the copy of the existing Maharashtra Govt policy of non conventional source of energy and also the order passed by Maharashtra electricity regulatory commission of wind energy.

SECTION – 5

SITE DESCRIPTION

5.1 SITE LOCATION

MOIL invites offers for installation and commissioning of 8.0 MW or nearby capacity Wind Power Project in the state of Madhya Pradesh, at the suitable site offered by bidder having procession of land and developed wind farm, subject to approval from MEDA.

In either case the bidder shall provide the certified wind data in the form of frequency distribution of the selected site from MNES or C-WET. The availability of land shall be ensured by bidder and shall be free from any dispute and legal liability. The cost of land (and its development) shall be borne by the bidder.

5.2 POWER EVACUATION FACILITY

The power evacuation is the responsibility of the bidder and use of existing MSEB/MEDA power evacuation facility shall not relieve the bidder of his responsibility. All necessary clearances including approval/payments in this regard from/to MSEB/MEDA, etc shall be responsibility of the Bidder. Bidder is advised to submit the details of existing power evacuation facility at proposed site.

Bidders shall design suitable power evacuation system to evacuate the power from the wind farm to the nearest MSEB Grid. The bidder shall indicate details of power evacuation system.

SECTION – 6

SCOPE OF SUPPLY AND WORK

The scope of works covered under this specification shall be but not limited to the followings:

6.1 Arrangement of Land and Approvals, Design, manufacture, testing at works, transportation & supply at site, 750-1250 KW rating, 400 V or at suitable L.T. system voltage, 3 phase, 50 Hz horizontal axis upwind down wind Electric Generator (WEG) complete with accessories as may be required for successful operation of wind farm of capacity totaling around 8.0 MW including suitable power evacuation system from the wind farm up to the MSEB Grid.

6.2 Design & construction of WEG tower along with foundation for the tower.

6.3 Design & construction of control system to give command to WEG's. Receive data, processing and getting required report on energy generation, wind speed etc.

6.4 Design & construction of control room (for housing the power and control panels of WEG(s) applicable in case of tubular type towers.

6.5 Micro-siting, erection, Testing, Commissioning of WEGs.

6.6 Design, Manufacture, Testing at works, Transportation, Supply, erection, Testing at site & commissioning of wind farm internal electrical system L.T. Cabling Lighting etc.

6.7 Interconnection to the MERC/MSEB pooling station from the wind farm (point of commencement of supply).

6.8 Land development, Design and construction of other civil works including.

- Approach road & wind farm internal roads.
- Water supply arrangement is to be made to cater the needs of wind farm.
- Suitable Communication System.

6.9 Obtaining statutory approvals clearances from Government Departments but not limited to the following –

- Airport authorities clearance if required.
- Pollution control board clearance, if required.
- MERC
- MSEB/MSEDCL
- MEDA

- Any other statutory/legal clearance from Govt. agency.

6.10 The successful bidder shall obtain necessary clearances from all concerned department/agencies whatsoever required for this contract.

6.11 Power and water required during the construction shall be the responsibility of the successful bidder.

6.12 Total Operation & Maintenance of wind farm for the First 2+18 year's period including deputation of Engineering, Personnel, Technicians and security personnel, Technicians and security person. Supply of Spares, Consumable, and Deployment of manpower and Maintenance tools etc., as furnished in the detailed scope in "Operation and Maintenance" chapter.

6.13 All equipment & item which are not specifically mentioned but are required for completion of work including commissioning, operation & maintenance of wind farm as per Technical Specification, in every respect and for safe and efficient operation and guaranteed performance.

6.14 Submission of following documents drawings data design and engineering information to owner or its authorized representative for review and approval in three copies by successful bidder

(i) Detailed technical specification.
(ii) Design criteria.
(iii) Design calculations.
(iv) General arrangement assembly drawings.
(v) Contour plan for the area.
(vi) Micro-siting plan & Wind farm layout.
(vii) Schematic diagram for entire electric system
(viii) G.A. drawings for O.H. lines, all types of strictures, 33 kV switchyard & interfacing.
(ix) Quality assurance plan.
(x) Test report (for type, acceptance, routing tests).
(xi) O & M manuals.

The drawings in the following category shall be submitted only for information to owner.

(i) Site storage manual.
(ii) Erection, testing & commissioning procedures and method statements.
(iii) Sub assembly drawings.

6.15 All drawings and digitized soft copy, shall be fully corrected to agree with the actual "as built" site conditions and submitted to MOIL after commissioning of the project for record purpose.

6.16 The contractor shall forward to owner :

(i) Schedule for various activities in the form of PERT Chart with in two weeks from effective date.

(ii) Fortnightly site work progress report during construction period and
(iii) Monthly O&M reports after commissioning of the project.

6.17 The Contractor shall arrange pre-dispatch inspection of offered equipment to determine performance by two MOIL Engineers at manufacturers/Collaborators end. The Contractor shall also arrange training for two MOIL Engineers for seven days at manufacturers/collaborators works & at site where erection and commissioning work is in progress for the offered machines. All the expenses towards inspection and training shall be borne by the Contractor.

6.18 Providing a detailed training plan for all operation, maintenance procedures, which shall after approval by owner, form the basis of the training program. The contractor shall also be responsible for training of owner's staff.

6.19 Preparation and supply of detailed Operation Manual and system manual of Power Plant and also Maintenance Manual.

6.20 Establishing a system to maintain in inventory of spare parts and tools, equipment, consumables and supplies for the facility's and operation.

6.21 The Contractor shall arrange comprehensive insurance coverage during EPC and O&M period

6.22 Maintain at the facility accurate and up-to-date operating logs, records and monthly reports regarding the operation & maintenance of facility.

6.23 Liasioning between MOIL/MSEB/MERC/MEDA/Govt of Maharashtra and other Govt agencies shall be responsibility of the contractor for entire period from date of placement of order to entire contract period (2+18 years)

6.24 The contractor shall ensure comprehensive insurance e of the complete plant for the period of 2+18(two plus eighteen) years from the date of successful commissioning of plant at the cost of the Owner. The cost of insurance shall be reimbursed on production of proof of payment. He shall coordinate with insurance authorities in settlement of the claim if any during the above period

PROFORMA OF BANK GUARANTEE
IN LIEU OF EARNEST MONEY DEPOSIT (PART I)

To
M/s Manganese Ore (India) Limited.
3,Mount road extension,
P.B. No. 34 Nagpur –440 001
Maharastra.

Bank Guarantee No…… Dt…….. executed by ……..(Name & address of the bank) on behalf of ……(Name & address of the tenderer) whereas M/s Manganese ore (India) limited (hereinafter referred to as "MOIL") have invited tender vide tender Notice No. SDGME(E/98/MS/06-07/1307 Dt 31/01/2007(hereinafter referred to as the said invitation to tender) for the work of setting up of about 8.0MW wind energy farm in Maharashtra on EPC(BOT) contract basis and whereas the said invitation to tender requires that any eligible tenderer wishing to make any offer in response thereto shall establish an irrevocable EMD in favor of MOIL in the form of bank guarantee, covering and amount of Rs…… Lakhs (……. Lakhs) only valid for a period of six months from the date of opening of the tender (to be extended as may be necessary till finalization the work and signing the agreement for the due fulfillment of the contract).

The condition of this obligation are:

1. If the tenderer withdraws or amends, impairs or derogates form the tender in any respect with the period of validity of this tender.
2. If the tenderer having been notified of the acceptance of his tender by MOIL during the period of its validity and fails or refuses to execute the contract.

We ……(hereunder referred t o as "the Bank" undertake to pay MOIL up to the above amount upon receipt of its written demand, without MOIL having to substantiate its demand, provided that in its demand MOIL will note that the amount claimed by it is due to it owing to the occurrence of one or both the two condition, specifying the occurred condition or condition.

This guarantee will remain in force up to and including 90 days the period of tender validity and any demand in respect thereof should reach the bank not later than the above date.
The guarantee will not be discharged due to the changed in the constitution of the bank or the said tenderer.

The bank has under its constitution power to give this guarantee.

……..

Date : **(signature & seal of the Bank)**

Place : **Address of the Bank**

PROFORMA OF BANK GUARANTEE IN LIEU OF SECURITY DEPOSIT

To
M/s manganese Ore (India) Limited.
3,Mount road extension,
P.B. No. 34 Nagpur –440 001
Maharastra.

1. In consideration of M/s manganese Ore (India) Limited, (hereinafter called "The company" which expression shall unless repugnant to the subject or context include its successors and assigns) having agreed under the terms and condition of Tender/Contract No ……. Made between …….. (Contractor) & the company in connection with setting up of about 8.0MW wind energy farm in Maharashtra on EPC(BOT) contract basis. Hereinafter called the said contract to accept a deed of guarantee as herein provided for Rs …… (Rupees ……) only from a nationalized bank in lieu of the security deposit to be made by the contractor or in lieu of the deduction to be made from the contractors bill, for the due fulfillment by the said contractor of the terms and conditions contained in the said tender/contract. We, the ……. Bank Ltd. (hereinafter referred to as " the said Bank" a company under the companies Act 1956 and having our registered office at …….. hereby undertake and agree to indemnify and keep indemnified that company from time to time to the extent of Rs……. (Rupees……) only against any loss, damage, cost, charges and expenses caused by reason of any breach or breaches by the said contractor or any of the terms and condition contained in the said contract and to unconditionally pay the amount claimed by the company on demand and without demur to the extent aforesaid irrespective of any dispute raised by the contractor.
2. WE, …….. Bank Ltd, further agree that the company shall be the sole judge of and as to whether the said contractor has committed any breach or breaches of any of the terms and condition of the said contract and the extend of loss ,damage, gross charges and expense caused to or suffered by the company or that may be caused to or suffered by the company or account thereof and the decision of the company that the said contractor has committed such breaches and as to the amount or amounts of loss, damage , costs, charges and expense cause to or suffered by or that may be caused to or suffered by the company form time to time shall be final and binding on us.
3. we, the said bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the

performance of the said contract and till all the dues of the company under the said contract or by virtue of any of the terms and condition of the said contract have been fully paid and its claim satisfied or discharged and till the concerned authorities certify that the terms and condition of the said contractor have been fully and properly carried out by the said contractor and accordingly discharges this guarantee subject, however that the company shall have no claim under this guarantee after the date of issue of Final Acceptance Test Certificate as provided in the said contract or from the date of cancellation of the said contract, as the same may be unless a notice of the claim under this guarantee has been served on the bank before the expiry of the said period in which case the same shall be enforceable against the bank not with standing the fact that the same is in enforcement after the expiry of the said period.

4. The company shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee or Indemnity, from time to time to vary any of the terms and conditions of the said contract or top extend time of performance by the said contractor or to postpone for any time and from time to time any of the powers exercisable by it, against the said contractor and either to enforce or forebear from enforcing any of the terms and condition governing the said contract or securities available to the company and the said bank shall no be released from its liability under theses presents by the exercise by the company of the liberty with reference to the matters aforesaid or reason of time being given to the said contractor or any other forbearance, act or omission on the apart of the company or any indulgence by the company to the said contractor or any other matters or thing whatsoever which under the law relating to sureties would but for this provision have the effect of so releasing the Bank form its such liability.

5. it shall not be necessary for the company to proceed against the contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the bank, notwithstanding any security which the company may have to obtain or obtained form the contractor shall be at the time when proceedings are taken against the bank here under be outstanding or unrealized .

6. We the said bank, lastly undertake not to revoke this guarantee during the currency except with the previous consent of the company in writhing and agree that any change in the constitution of the said contractor or the said bank shall not discharge our liability hereunder.

Dated this…….day of ……..
……

(For & on behalf on the bank)
The guarantee is accepted by the ……..

……

(Name of the company ,address)

PROFORMA FOR PERFORMANCE BANK GUARANTEE

Bank Guarantee NO…….

1. In consideration of Manganese Ore (India) Limited,3,mount road extension P.B. No 34 Nagpur-440 001 (hereinafter called "MOIL" having awarded to M/s……(hereinafter called "the contractor") a by issue of LOI/Work for …….. and the contractor having agreed to provide a performance and condition of the contract equivalent to Rs……. As 10 Percent (%) of said value of the contract to MOIL
2. we, the Bank having its registered office at ……. (hereinafter referred to as "the bank") do here by guarantee and undertake to pay MOIL on demand any or all sums payable by the contractor to the extent of Rs…….. as aforesaid at any time unto …….. (date) without any demur reservation , contest, recourse or protest under/or without reference to the contractor against any loss or damage cost to or suffered by MOIL by reason of any breach by the said contractor of any terms and condition content of the said contract.
3. we, the bank undertake to pay to moil any money so demanded not withstanding any dispute or disputes by the said contractor any suit or proceeding pending before any Court or Tribunal relating there to, our liability under this present being absolute and unequivocal.

   The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and said contractor shall have no claim against us for making such payment.
4. We the bank further agree that the guarantee herein contain shall come into force from the date hereof and shall remain in full force and effect till the period that would be taken for the performance of the said contract and that it shall continue to be enforceable till all the dues of MOIL under or by virtue of the said contract have been fully paid and its claims satisfied or discharged or till MOIL certifies that the terms and condition of the said contractor and accordingly discharges the guarantee. The guarantee shall, however remain in force till the date ……and unless the guarantee is renewed or the claim is preferred against the bank within 3 (three) months in writing form the expiry date, all rights of MOIL under this guarantee shall cease and the bank shall be released and discharged form all liabilities under this guarantee thereafter.

5. we, the bank further agree with MOIL the MOIL shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and condition of the said contract or to extend time of performance by the said contractor from time to time or to postpone for any or from time to time any of the power exercise able by MOIL against the said contractor and to for bear or enforce any of the terms and condition relating to the said contract wand we shall not be relived from our liability by reason of any such variation. Or extension being granted to the said contractor or for bearance act or omission on the part of MOIL of any indulgence by the said contractor or by any such matter of thing whatsoever which is under the law relating to sureties would but for this provision have effect of so relieving us
6. The guarantee will no be discharged due to the change in the constitution of the bank or the said contractor.
7. We, the bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of the MOIL in writing.
8. The bank has under its constitution power to give this guarantee

and…….
(Name & address of the Bank)

Dated this…….. day of……
Place ……

(SIGNATURE OF THE AUTHORIZED PERSON FOR AND ON BEHALF OF THE BANK)

PART B

Section 7

TECHNICAL SPECIFICATION

This technical Specification covers the technical requirement of design, manufacturer, testing at works, supply, installation, testing and commissioning of power equipment for complete erection and commissioning and operation and maintenance for 20 consecutive years for 8.0 MW or nearby capacity Wind Electric Farm. However, these are indicative specifications for technical bid.

7.1 TECHNICAL SPECIFICATION FOR WIND ELECTRIC GENERATORS (WEGS)

7.1.1 TYPE AND RATING OF WEGS

The WEGs shall be of

a) Rating shall be between 750 kW to 1250 kW
b) Upwind/downwind
c) Three bladed type
d) Horizontal axis with active yawing
e) Grid connected type and
f) Single speed/Dual speed/Variable speed

The WEGs shall be suitable for continuous operation under the following grid conditions and to suit the site conditions. Generator output shall be as follows

Voltage	:	WEG generation voltage = 400V+/-13%
Frequency	:	50Hz (+1.5Hz-3 Hz)

The WEG shall have adequate protection and control to operate in tandem and be synchronized with the utility grid. The tolerance limits indicated above may however be exceeded in actual conditions and the WEGs shall be protected from damages against such exceeding of limits.

7.1.2 DESIGN CRITERIA

The WEG(s) shall be designed to have lifetime of not less than 20 years for continuous operation. The bidder shall indicate the list of components whose lifetime may be less than 20 years.

7.1.3 LOCAL CONTROL SYSTEM

Each WEG shall have a local control system (LCS) and it shall be suitable for the specified site conditions and designed for automatic, unattended operation, and based on a microprocessor-controlled system with a power back up. The microprocessor and power control units shall be located separately and well ventilated. In case of tubular tower, the LCS shall be capable of operating satisfactorily at the prevailing temperature inside the tower, without exceeding the permissible temperature rise.

7.1.4 PROVISION FOR CENTRALIZED MONITORING SYSTEM WITH SCADA.

The local control panels/control system. A centralized monitoring system (CMS) shall be provided which shall be able to display all the parameter in local control panel. CMS should also be capable of controlling the wind farm oper;ation. The local control panels/control system having suitable provision for connection with centralized monitoring system.

7.1.5 THE LCS SHALL BE ABLE TO

A. Display and record the following parameters:

- Power (kW)
- Voltage(V). of all three phases in R.M.S. values.
- Frequency (Hz)
- Current (A) of all three phases in R.M.S. values
- Power factor
- Rotor revolution speed (rpm)
- Auxiliary generator revolution speed (rpm) (if any)
- Main generator revolution speed
- Brakes activated
- Maximum power generated (kW) with time of generation
- Cumulative energy production by auxiliary generator (kWH) (if any)
- Cumulative energy production by main generator (kWH)
- Cumulative energy consumption from grid.
- Energy production for the day (kWH)
- Energy production for the month (kWH)
- Operation time of auxiliary generator (hr) if any
- Operation time of main generator (hr)
- Status of wind turbine
- Actual reactive power production (kVAR)
- Jaw angle
- Local wind speed (m/sec)

- Local wind direction
- Maximum wind speed recorded (m/sec) with time of occurrence
- Average wind speed for the day (m/sec)
- Average wind speed for the month (m/sec)
- Gear box temperature (deg”C)
- Mechanical brake (blocks) temperature (deeg”C)
- Hydraulic oil pressure
- Main generator temperature (deg”C)
- Auxiliary generator temperature (if any) (deg”C)
- WEG availability period integrated on a period of 1 year.
- Full period in Hrs. integrate on monthly basis.
- Grid availability in hrs. on monthly basis.

B **Annunciation’s for the following conditons** :

- Low oil level or pressure in gear box.
- Yaw failure
- Cable twist failure
- Control system failaure
- Vibration of the nacelle
- Worm brake pads
- Abnormal Temperature in generator, gear box, yaw motor, brake callipers
- Grid failure i.e., frequency error, excess current, asymmetry, voltage failure
- Over-speed of rotor
- Activation of emergency stop brake
- Over temperature in switch board
- Failure of capacitor

C **Stop display and restart again when conditions are acceptable** :

- Low wind speed
- Untwisting of cables
- Activation of stop push button (Restart when start push button is activated)

D **Stop the WEG(s) automatically, whenever the grid supply fails.**

E **Auto start of WEG(s) on resumption of healthy grid supply**.

7.1.6 **GENERATOR**

The generator shall be of three phase Synchronous/asynchronous dual winding type with squirrel cage rotor, totally enclosed, surface cooled and suitable for continuous operation at rated voltage. 50Hz (+1.5Hz-3 Hz) on grid connection. The generator shall be designed for tropical environment and in accordance with relevant Indian Standard/International Standards, which should be stated in the offer in adequate detail. The rated output and voltage shall match the varying availability of wind energy on the one hand and the entire possible grid conditions on the other. The insulation shall be of class F, and protection IP : 54/IP : 23 as the case may be.

In case variable speed WEG(s) are offered, full details of the AC/DC/AC conversion system offered must be furnished along with the offer. The power electronics shall be suitable for site conditions.

7.1.7 **CAPACITOR**

The WEG shall be provided with capacitors for attaining a minimum average power factor of 0.90 at full load with three steps of cut in facility. The capacitors shall cut in after the start up procedure is completed. The bidder shall furnish the rating of the capacitors. The capacitors shall be housed in a separate panel, such that proper ventilation is maintained and the heat dissipated from the capacitors shall not affect the other components in the switchboard. The capacitors should be designed for tropical environment and in accordance with relevant international and Indian standards, which should be state in the quotation. The voltage rating shall match the voltage rating of the generator voltage.

7.1.8 **BRAKING SYSTEM**

The WEG(s) shall have two independent braking systems out of the two brakes; one of them may be aerodynamic type and act at 10% over speed of the propeller. If aerodynamic brake is not provided then the bidder should furnish full details to say how the WEG(s) will be sage.
Preference shall be given for slow speed machines without mechanical Breaks, to avoid excess replacements /repairs of break pads. Only Air breaks shall be given preference

7.1.9 **TOWER**

The **tower should be tubular type** with suitable hub height to match the site condition. Where tubular towers are provided for Stall regulated WEGs using tip spoilers, the tower should preferably have inspection door for tips spoilers checking and maintenance. The tower shall be galvanized or epoxy painted as per specification. The tower should have convenient climbing devices. Safety rope and belts should be supplied. One set of template to fix the foundation bolts in the concrete should. Necessary foundation bolts should also be supplied. All the foundation bolts should be galvanized.

7.1.10 **SWITCH BOARD :**

For each WEG(s) a switchboard shall be installed which must include all power distribution for the WEG protection systems, soft start, capacitors control etc. The general data for the switchboard are as follows:

Voltage	:	WEG Generation voltage (400V +/- 13%)
Frequency	:	50 Hz (+ 1.5Hz or – 3Hz)
Short circuit level	:	8 kA
Degree of protection	:	IP 54

Switchboard shall be provided with adequately rated copper busbar, incoming control, and outgoing control etc. as a separate compartment inside the panel to meet the requirements of the CEA/CEIG.

The switchboard and control panel shall be designed and manufactured in accordance with the relevant International and Indian Standards and shall be suitable for the site conditions specified.

7.1.11 M**CCB**

1 No. additional molded case circuit breaker of adequate rating exclusively for controlling the outgoing feeder/cable to the I.T. terminals of transformer shall be provided.

7.1.12 ENERGY METER

1 No. Utility calibrated energy meter with provision of backstop, which will prevent the meter from rotating backwards when power is drawn from the grid for checking/comparing the guaranteed energy generator shall be provided. Bidder shall note that the energy recorded by this meter shall only be taken for recording the generated annual energy, duly approved by utility as per the regulations.

7.1.13 INTERFACING WITH THE GRID

Each WEG or group of WEGs will be connected to grid through a step-up transformer of suitable capacity and voltage rating.

7.1.14 PROTECTION AGAINST HIGH TEMPERATURE AND DUST STORMS

The temperature at the location considered will be low during the winter season and high during the summer season. Also the site is prone to sand storm with high dust loading. Hence, WEGs need to be suitably protected. All materials, components and equipment shall function and work properly during the lifetime without deterioration due to aggressive climate conditions and dust loading.

7.1.15 EARTHING AND LIGHTING PROTECTION

The earthing system of WEG shall be under the scope of the Bidder. All the frames of every electrical equipment shall be effectively connected to earth at two points. The Bidder shall provide material required for earth electrode as well as earth current carrying conductor. The combined earth resistance at each wind electric generator shall be less than 1 Ohm. The earth electrode must be designed to withstand and maximum possible short circuit current and the length of the electrode shall be such that the combined earth resistance is less than 2 Ohm.

All the three separate independent earthing shall be provided for electronic control, electrical system and lightning arrester system

The Bidder shall also provide suitable earthing system to protect the Blades, Needle, and tower and step up transformer against lightening. Effective earth resistance of electrodes shall be less than 2 (two) Ohms and the combined earth resistance shall be less than 1 Ohm. The work shall be executed as per IS: 2309. 3034. The Bidder should append a drawing showing the earthing arrangement of the WEG and transformer.

The bidder should conform that in case of damage to any of the blades due to lightning the bidder should replace the set of blades free of cost to avoid any unbalance in the blades

7.1.16 ENVIRONMENTAL PROTECTION

The tubular towers shall be galvanized to relevant standards applicable to galvanization of fabricated steel structures. The Bidder shall describe the process of galvanizing proposed to be adopted for the tower. The tower will be inspected at site and if any damage to galvanization is noticed will have to be replaced to the satisfaction of the purchaser or his inspection agency. Site galvanization or site repairs will not be permitted.

The painting/galvanizing of towers & WEG should confirm to ICAO specifications.

7.1.17 TOWER FOUNDATION

Foundation arrangement proposed by the Bidder shall be suitable for the soil conditions prevailing at the proposed site.

7.1.18 CONTROL ROOM

Control room, if applicable in case type of the tower calls for housing the switchboard and local control panel, shall be designed to suit the solid conditions. The size of the room shall be adequate to house the equipment with required clearances and operating space as required by CEA/CEIG. Room shall be constructed out of good quality stone/brick wall of not less than 230 mm. Roof slab shall be of RCC as per standard practice. Door, Window, Ventilators shall be of metal construction and painted with 2 coats of paint over two coats of suitable primer. Cable trench as required shall be provided. The contractor shall furnish the plan and construction details of the control room for approval, before proceeding with the work.

7.1.19 STANDARDS & STATUTORY REQUIREMENTS

The WEGs and other equipment's should conform to the relevant International, Indian Standards and shall meet all the CEA/CEIG & local statutory requirements. The Bidder shall furnish the standards adopted by them.

7.1.20 INSPECTION AND TESTING

All items will be carefully inspected and tested during manufacture and approved prior to dispatch in accordance with the applicable standards by the manufacturer. Triplicate copies of all test certificates including bought out components/equipment shall be furnished for approval before dispatch. Supplier shall furnish the list of tests to be conducted in the presence of customer/consultant/third inspector.

Purchaser shall reserve the right to inspect the equipment/components at the manufacturer's works. Purchaser shall have an open set for conducting quality inspection of the system as well as components as and when deemed necessary. Purchaser may engage third party inspection agencies for achieving the assured quality of the components. Supplier shall extent the necessary cooperation to the third party inspection agencies besides to purchaser's inspection team for effectively carrying out the inspection/testing. However, stage inspection by purchaser does not absolve the responsibility of the supplier in providing then performance guarantee/warranty. Supplier shall strictly comply with the quality requirements suggested by the inspecting authorities from time to time.

7.1.21 MICRO-SITING, ERECTION, TESTING & COMMISSIONING

The contractor shall carry out micro siting, erection, testing, startup and commissioning. The contractor is responsible to bring to site and deployment of all tools, cranes and other instruments required for this purpose.

7.1.22 OPERATION & MAINTENANCE:

Soon after successful completion and commissioning of wind farm the contractor shall start doing the O&M works as directed by MOIL. However the contractor should complete the works/submit documents as mentioned below before taking up the O&M work.

a) Short Term (360 hrs.) Trial Operation:

The EPC work of the project shall be considered as commissioned and completed on continuous generation of electricity for 360 hours with 100% availability of WEGs and generation of electricity from the wind farm as per power curve of the WEGs. The contractor shall demonstrate the following during the short-term test run.

1) Generation of rated capacity of power for the prevalent wind conditions.

2) Healthiness of yawing and power regulation mechanisms.

3) The cut-in & cutout operation at the present wind speeds.

4) A comprehensive testing of all control. Instrumentation. Interlocks, protections Annunciations etc.

5) Recording of reactive power consumption.

6) Recording of noise level.

b) Submission of Warranty Certificates.
c) Submission of 3 (three) sets of operation and maintenance manuals.
d) Submission of all related as built drawings documents/technical information.
e) Training of client's engineers.

7.1.23 **TECHNICAL DATA**

The successful Bidder shall submit three copies of the following technical data information/documents for approval as below: -

- Bar chart within two weeks offering manufacture, delivery, erection, testing and commissioning of WEG, tower, casting of foundation, construction of control room (if any) etc.
- Specification/Designs/Drawings for the following shall be submitted within four weeks from the date of the order.
- Layout indicating location of WEG and Control panel.
- Complete technical specifications and drawings of the WEG, including rotor, nacelle, tower and microprocessor based control panel.
- Engineering drawings like layout of machinery inside nacelle, including electrical equipments.
- Schematic and detailed wiring diagrams for power control and interlocking circuits.
- Detailed drawings showing control circuit interconnection drawings and other service requirements.
- Logic scheme, layout, wiring diagrams including interconnection details for centralized remote monitoring system (when included in the scope).
- The specification of lightning and other protection.
- Design & detailed drawings for WEG tower.
- The design and detailed drawings for tower foundation and control room, including cable trench.
- Specification for control room construction material and quality.
- Drawings of control room lighting & tower lighting.
- The power curve along with certifications/guarantee indicating the parameters under which the power curve was certified and recommended procedure for site verification of power curve.
- Detailed earthing layout and material used in earthing system.
- Performance guarantee test procedure.

- Type tests, routine tests and acceptance tests are to be specified for WEG.
- The works test certificates for all plant and machinery.
- The specification for environment protection.
- Description of erection mode, detailed erection drawings and manuals.
- Operation/maintenance/trouble shooting manual including other drawing for local control system.

7.2 WEGS FOUNDATION AND OTHER CIVIL WORKS

7.2.1 SCOPE OF WORK

The scope of work under land acquisition and civil work shall include

a) Allocation of Land.
b) Land development for the wind farm.
c) Conducting contour survey and soil testing.
d) Foundation of WEGs.
e) Foundation for WEG step up transformer & HT switchgear kiosk,
f) Room for housing WEG local control panel (applicable for WEGs with lattiee type tower).
g) Construction of suitable control room for housing the CMS system equipped with air conditioner.
h) Office cum stores building, erectors hostel and security house.
i) Wind farm approach road and internal rods, and.

7.2.2 DESIGN CRITERIA

All civil, structural and architectural work shall be designed, supplied and constructed as per latest editions of Indian Codes and Standards with addendum's and supplements issued by IS. Wherever Indian Standards are not available/formulated, applicable BS or International Standards shall be used. In case of ambiguity between codes, specifications and drawings, the mot stringent of them shall govern.

7.2.3 SWITCHYARD CIVIL WORKS

Switchyard civil work includes step up transformer plinth, HT Switchgear kiosk plinth, two pole 4 pole structure foundation, earth pits, metal spreading curb wall in and around switchyard and fencing, The transformer/HT switchgear kiosk plinth shall be made of brickwork of Random Rubble masonry conforming to

relevant standards. The height of transformer/HT Switchgear kiosk plinth shall be decided based on 33 kV ground clearance.

7.2.4 ROADS WITHIN WIND FARM

Roads within wind farm shall be provided with water bound macadam 3.75m wide (WBM) roads. The WBM road shall be made of one layer of 38-75 mm down graded aggregate blinded with red Murum/gravel and water bound macadam of 100 mm compacted thickness using 38-75 mm aggregate with red gravel/murram blindage including consolidating the sub base with 8 to 10 ton roller. 3.75 m wide WBM road from main entrance to control room building shall be provided. 1000mm wide shoulder on either side of the road shall be provided.

7.2.5 INFRASTRUCTURE DEVELOPMENT

Approach road

The bidder shall provide detail drawing and specification of type of road construction offered and length of the road.

Internal road

The bidder shall submit the internal road map and detail specification and type of road constitution for approaching individual wind energy generator and other infrastructure

Energy meter

The bidder shall provide the energy meter as per the requirement of the State Electricity Board.

7.3 TECHNICAL SPECIFICATION FOR WIND FARM ELECTRICAL SYSTEM

This specification covers the technical requirements of design, manufacture, testing at works supply installation testing & commissioning of all equipment's required for the wind farm Electrical system proposed to carry power from WEG(s) and feed it to the State grid. The scope covers the work starting from the local control panel f WEG and up to the Grid tie up with the State grid.

The Major equipment involved in the scope are :-

(i) To step up generator Voltage to 33 kV, step up transformer.

(ii) Supply of 33 kV outdoor switchgear kiosk for total windfarm control & Grid tie up –

(iii) Supply of Balance equipment and Erection, Testing & Commissioning of wind farm electricals.

7.3.1 33 KV STEP UP TRANSFORMER

7.3.1.1 Scope

This specification covers the technical requirements of design, manufacture, testing at works, supply of step up transformers complete with all accessories for efficient and trouble-free operation.

7.3.1.2 Standards

The equipment cover by this specification shall , unless otherwise stated be designed constructed and tested in accordance with latest revision of relevant Indian standards and shall confirm to the regulation of local statutory authorities.

IS:2026	-	Power transformer
IS: 10028 of transformer	-	code of practice for selection installation and maintenance
IS:2099	-	Bushing for alternating voltage above 1000V
IS:3637	-	Gas operated relays
IS:4257	-	dimension for clamping arrangements for porcelain Transformer bushings
IS:335	-	new insulating oils
IS:6600	-	guide for loading of oil immersed transformer
IS:3639	-	Fittings & accessories for power transformer

The transformer supplied shall satisfy all the requirements of local statutory authorities and modification if any required at site shall be carried out by the supplier at their own cost.

7.3.1.3 VOLTAGE AND FREQUENCY VARIATION

Transformer shall operate without injurious heating on any tap under the following condition provided increase in voltage is not accompanied by reduction in frequency.

1) at rated KVA at any voltage within +10% of the rated voltage
2) at rated current at a voltage equal to 105% of the rated voltage
3) at frequency variation of +1.5Hz-3Hz

7.3.1.4 **OVERLOADS**

it shall be possible to operate the transformer satisfactorily upto overloads of 150% of the rated value in confirmation with the loading guide specified in IS: 6600. There shall be no limitation imposed by bushing tap chargers auxiliary equipments to meet this requirements.

7.3.1.5 **RATED VOLTAGE AND TAPPING**

The principal tapping rated voltage shall be as specified, the tapings shall provide a variation in the transformer ratio without ordering phase displacement. All tapping shall be full power tapping.

7.3.1.6 **IMPEDANCE VOLTAGE AND SHORT CIRCUIT IMPEDANCE**

The impedance voltage at principal tapping shall be specified in the technical particulars.

7.3.1.7 **SHORT CIRCUIT WITHSTAND CAPABILITY**

The transformer shall be designed and constructed to withstand without damaged the thermal and dynamic effects of external short circuit under the condition specification in IS: 2026

7.3.1.8 **INSULATION LEVELS**

The insulation shall withstand the ratted lighting impulse voltage and power frequency withstand voltage as specified in relevant IS.

7.3.1.9 **MARSHALLING BOX**

a) The box shall be mounted either on the transformer tank or on a separate mounting frame with brackets and shall conform to IP:55 degree of protection for the enclosure

b) This box shall contain all auxiliary devices except mounted on the transformer. The control terminal and connectors shall have suitable current carrying conductors. a removable bottom gland plate shall be furnished for cable entry

7.3.1.10 **CABLE BOX**

The cable box shall be of outdoor type sheet steel construction, self-supporting with all standard facilities including the body earth terminal. It shall be air-insulated unit. Suitable stud bolt with washers shall be provided inside the cable brass box for cable Armour with necessary pad for connecting to the main earth bus.

7.3.1.11 **OFF CIRCUIT TAPS CHANGING GEAR**

a) the off load tap changing gear shall be provided on the H.V windings for a variation of no load voltage as specification .

b) it shall operate by an external three phase operated switch .

c) a visual tap changing indicator for the tapping shall be provided and provision shall be made to padlock the handle in each tap position.

- Rating plate
- Terminal marking plate
- Lifting lugs
- 2 earthing terminal with lugs
- Thermometer pocket
- Jacking pads

- Undercarriage fitted with flat bi directional roller

7.3.1.12 **NOISE AND VIBRATION**

Care shall be taken to ensure the design and manufacture so as to reduce noise and vibration to the level of that obtained in good modern practice

7.3.1.13 **Painting**

All accessories and transformer tank shall be sand blasted and grounded to produce a smooth clean surface free from scale grease and rust.

After cleaning the surfaces shall be given a phosphate coating followed by a coat of high quality primer. The transformer shall be finished with two coats of paints.

7.3.1.14 **TESTS**

FACTORY TESTS

Complete tests shall be made at the manufacturer's plant to determine the performance and operating characteristics if the assembled transformers and their respective accessories to determine whether or no the guarantee have been met unless otherwise specified all test shall be carried out in accordance with IS: 2026and shall include the following.

ROUTINE TESTS

a) Resistance measurement of all winding on the rated voltage connection and on all taps.
b) Ratio test on the rated voltage connecting and on all taps
c) Polarity and phase relation test.
d) Impedance and loan at rated current on the rated voltage connection (principal tap) and on all taps
e) No load loss and current at rated voltage
f) Dielectric test
g) Insulated resistance test on winding auxiliary device core and tank.
h) Test on tap charger

TYPE TEST

The bidder shall furnish Two (2) copies of types certificate along with the tender similar rating of transformer already conducted.

7.3.1.15 DRAWING AND MANUAL

The following drawing and manual shall be submitted to the engineers for reference after award of contract in quadruplicate

A) General arrangements of transformer showing
   1) Details of terminals
   2) Conservator with its supports
   3) Explosive vent
   4) Radiator with values air release and oil drain plugs
   5) Marshalling box
   6) Disconnecting chamber and cable box connecting arrangements
   7) Marshalling box wiring diagram
   8) Rating & diagram plate drawing

b) Manufacturing schedule and test schedule

c) Installation, operating and maintenance manual.

7.3.1.16 SPARE

the bidder shall submit a recommended list of commissioning spares along with item wise price for each component for two (2) years of operation.

7.3.1.17 FITTINGS & ACCESSORIES

The following accessories shall be provided

1)	Oil filing hole with cover	-	1 No
2)	Conservator with stump and drain value with plug/cover plate	-	1 No
3)	Oil level indicator with minimum and filing level markings	-	1 No
4)	Thermometer pockets (without thermometer) 1 No	-	
5)	Air release plug on tank cover 1 No	-	
6)	Lifting lugs (4 Nos minimum) 1 Set	-	
7)	Dehydrating breather with silica gel and oil seal	-	1 No
8)	Off circuit tap changing switch on tank cover with tap position Indicator, lock and handle for taps switch	-	1 Set
9)	Brass earthing terminals for transformer body earthing (With brass nuts and washers)	-	2 Sets
10)	Rating and diagrams plate	-	1 No
11)	Drain cum button filter valve	-	1 No
12)	Base channel with rollers	-	2 No
13)	Double diaphragm explosive vent with sight glass	-	1 No
14)	Radiators	-	1 Set
15)	Terminal marking plate	-	1Set
16)	150 mm dial type oil temperature indicator with Maximum pointer	-	1 No
17)	Marshalling box	-	1 No
18)	Bushing for the HV side	-	1 Set
19)	Bushing for the LT side	-	1 Set

7.3.2 **33 KV VCB OUTDOOR WITH CT/PT MOUNTED.**

7.3.2.1 **SCOPE**

This specification covers the technical requirements of design manufacture, test at manufacturer's works and supply of HT Switchgear VCB panel to the site complete with all accessories for efficient and trouble free operation.

The switch gear and accessories shall be complete in all respects and any device not included in the specification but essential for proper operation of the equipment and also to comply with the requirements of the statutory authority shall be deemed to have been included and within the scope of the specification

whether specifically mentioned in the technical specification/technical particulars or not

7.3.2 .2 STANDARDS

The equipments covered by this specification shall unless otherwise stated be designed constructed and tested in accordance with the latest revision of relevant Indian standards and shall conform to the regulation of local statutory authorities.

The panel supplied shall satisfy all the requirements of local statutory authorities and modifications if the supplier at his own cost carry any required at site out

7.3.2.3 GENERAL REQUIREMENTS

a) The circuit breaker shall be vacuum –circuit breaker/SF6 gas circuit breaker (as called for in technical particulars)

b) Switchgears shall be out door type weather proof , floor mounting and metal enclosed draw out type, incorporating enclosure of the circuit breaker unit bus bar chamber current transformer potential transformers with necessary meters relay and switches auxiliary wiring etc**.**

c) the switchgear shall be of robust construction designed for maximum reliability of service in the tropical climate specified suitable for outdoor installation

d) Enclosures shall be provided with lifting lugs.

e) All retaining catches, screws and bolts for doors and covers shall be ho dip galvanized. All cover door and joints shall be gasketted.

f) All hardware for the complete equipment including foundation bolts lifting lugs etc shall be supplied along with the panel.

g) For SF6 circuit breaker the rate of gas leakage per annum shall be guaranteed and shall not be greater than 1% for any compartment.

7.3.2.4 CLEARANCE

Minimum insulator lengths and clearance in air shall not be less than those specified in relevant IS of latest issue**.**

7.3.2.5 TEMPERATURE RISE

The design ambient shall be taken as specified in project information/site data. The limits of temperature rise determined in accordance with the relevant standard shall be reduced much that the final temperature obtained at site does no exceed the final temperature computed by the addition of the design ambient temperature to the permissible temperature rise as indicated in the data sheet**.**

7.3.2.6 CURRENT RATINGS

Every current carrying part of the equipment including circuit breakers current transformers. Isolation switches, bus-bars, connections and joints shall be capable of caring its rated current continuously and in no part shall the permissible temperature rise be exceeded**.**

7.3.2.7 MAKING AND BREAKING CAPACITIES

Each circuit breaker shall be capable of making and baring 3 phase symmetrical short circuit currents. The supplier shall submit for approval certified test certificates of making and breaking tests carried out by approved independent testing authorities in accordance with relevant is for purchase ‘s approval

7.3.2.8 CIRCUIT BREAKER TYPE

All circuit breaker shall be of some make and type and shall be interchangeable. The type shall be as specified in Technical particulars.

7.3.2.9 CONTACTS

All contacts parts shall be readily and quickly replicable. Where contact parts are by design not intended to be dismantled, the completed contact assembly shall be easily replicable with the minimum of special tools.

7.3.2.10 CIRCUIT BREAKER ISOLATING FEATURES

a) The circuit breaker shall have the positions, ‘Service’, ‘Test’ and ‘isolated’ with the cubical door closed. Necessary position indicator shall be provided to indicate the above positions of the breaker.
b) Each circuit breaker shall be connected to the bus bars and feeder circuits through plug and socket type isolating devices.
c) The main circuit isolating contract and also all secondary circuit isolating plug-in contracts shall be of the self- aligning type, mounted at accessible positions to permit maintenance.

7.3.2.11 INTERLOCKS

All mechanical interlock to prevent mall –operation shall be of the preventive type and shall be arranged as close as possible the point at which mechanical force is applied, in order to prevent defeat of the interlocks by distortion of linkages. Electrical interlocks shall also function so as to prevent mall-operation of the circuit breaker.

Clearly labeled mechanical interlocks shall be provided which are assigned to prevent.

a) a closed circuit breaker from being withdrawn or inserted into the isolating contracts.
b) The closing of a circuit breaker except when correctly located in service, and test position.

7.3.2.12 BUS-BARS AND CONNECTIONS

a) Bus bars and connections shall comply with applicable clauses of relevant IS of latest issue.

b) The bus bars and connections shall be made of high conductivity copper or aluminum as specified in data sheet. The bus bars shall be amply sized to carry the rated continuous current under the specified ambient temperature without exceeding the total temperature of 90 C Bus bar shall be supported on suitable insulators**.**

c) Phase colors shall be red-yellow-blue and colour sleeves shall be provide at regular intervals.

7.3.2.13 EARTHING

a) All metal parts other than those forming part of an electrical circuit, shall be connected by hard-drawn, high conductivity, copper earth conductor to the main earth bus on each unit.

b) It shall be bolted to the main frame and shall be located so as to provide convenient facilities for earthing cable sheaths and for use with earthing devices.

c) The truck for draw-out circuit breakers shall be connected to the earth bar through a substantial plug type contact and the plug shall be long enough to have perfect earth contact and allow the bus-bar and feeder shutters to close before breaking earth contact.

d) The cases if instruments, relays and meters shall be connected to the main earth bar by copper conductors of cross sectional area not less than 2.5 sq. mm.

e) One main earth bus must run all along the length of the panel and connected to two studs/terminals meant for external earthing.

7.3.3.14 INSULATORS

Insulators of mould or resin bonded material shall have a durable, non-hygroscopic surface finish having a high anti-tracking index. Provisions shall be made to accommodate expansion and contraction of the connection, to take care of temperature rise likely to be attained during fault conditions.

7.3.2.15 CONTROL SWITCHES

Control switches shall be of 'spring return to neutral' type and selector switches shall be of stay put type. The contacts of all switches shall be shrouded to minimize ingress of dust and accidental contact**.**

7.3.2.16 AUXILIARY SWITCHES

Each circuit breaker shall be provided with auxiliary switches to interrupt the supply to the closing mechanism and to complete the tip circuit, when the circuit breaker is in the 'Closed position' and to cover all the necessary indication interlocking and control facilities.

Each circuit breaker shall be provided with 8 NO+ 8 NC auxiliary contacts as spare in addition to the other functional requirements and wired unto the terminal blocks for external connections**.**

7.3.2.19 CURRENT TRANSFORMERS

The current transformed shall comply with the relevant is of latest issue. The current transformers shall have synthetic resin insulation and be of the single-phase type with separate core for metering and separate care for protection.

7.3.2.20 POTENTIAL TRANSFORMERS

The potential transformer shall have synthetic resin insulation and be of the single-phase type. With separate core for metering and separate core for protection. Voltage ratio accuracy class and burden shall be as specified in Technical **particulars.**

7.3.2.21 TESTS

Factory Tests

Complete tests shall be made at the manufacturer's plant to determine the performance and operating characteristics of the assembled circuit breakers, and their respective accessories and to determine whether or not the guarantees have been met**.**

Unless otherwise specified, all tests shall be carried out in accordance with relevant is and shall include the following also:

Routine/acceptance tests

a) Mechanical operation tests
b) Power frequency voltage test
c) Tests on auxiliary & control circuits
d) Measure of resistance of the main circuit

Type test

a) Braking and making capacity tests
b) Short time current tests
c) Temperature tests
d) Lightning impulse voltage test

The purchaser/consultants representative shall witness all routine/acceptance tests. The Bidder shall furnish two sets of type test reports for all the tests along with the Bid.

TEST CERTIFICATES

Two copies of routine/acceptance test certificate shall be produced with the endorsement of the inspecting authority to the purchaser before effecting dispatch. The test report shall contain the following information: -

a) Complete identification data including serial no of the panel
b) Method application where applied duration and interpretation of results in each test.

7.3.2.22 SPARES

The bidder shall submit a recommended list of commission spares along with item wise price for each component for two years of troubles free operation

7.3.3 SUPPLY OF BALANCE EQUIPMENT AND ERECTION TESTING COMMISSIONING OF WIND FARM ELECTRICALS.

7.3.3.1 SCOPE

The scope of wind farm electrics includes design, manufacture and test at works supply, installation, erection, testing & commission of the following.

1) 33 kv step –up transformer substation
2) 33 kv over head line
3) 33 kv point of commencement of supply.
4) VAR compensation system, cabling, lighting, earthing, miscellaneous accessories and activities.
5) Erection, testing & commissioning of 33 kv step up transformer and 33 kv switch gear kiosks.

The equipment's materials offered by the bidder shall be of approved make, suitable for use in a normally polluted atmosphere and at the specific site condition.

The equipment/ materials shall be manufactured strictly in accordance with the latest relevant Indian standards and all similar materials and removable parts shall be inform and interchangeable with one another.

7.3.3.2 33 **KV OVERHEAD LINE**

1) GENERAL

The overhead line installation shall be carried out as per the following latest standards /documents in addition to the drawings specification /schedules enclosed with this document.

- MPSEB specification and norms for 33 KV, 11KV and LT lines
- CBIP standards on overhead line.
- CEIG and other Regulation.
- Relevant Indian standards.

2) ROUTING OF OVERHEAD LINE

The touting shall be of shortest practicable distance. The routing shall be decided such that required safety clearance are maintained and finalized in consultation with state electricity Board.

3) SAFETY CLEARANCE

Relevant MPSEB and IE rule 1956 construction standards shall be referred which gives the details regarding phase to phase clearance, positioning of cross arms, pole top bracket clamps etc. In addition to the details given below. However, the clearance adopted shall meet the requirement of MP transmission co /DISOM.

7.3.3.3 TECHNICAL REQUIREMENTS OF 33 KV POINT OF COMMENCEMENT OF SUPPLY IT SHALL BE DONE AS PER REC MANUAL.

7.3.3.4 VAR COMPENSATION SYSTEM

In addition to capacitors provided in each WEG for power factor improvement, separate VAR drawl compensation system shall be provided. Hence dynamically varying reactive compensation system (DVRC) shall be provided for the wind farm in a centralized location with necessary auxiliary required.

7.3.3.5 L.T POWER CABLE

1) This specification covers the design manufacturing testing at works inspection transportation delivery at site laying & commissioning of LT power cable and control cable. The cable shall be designed manufacturing and tested in accordance with the latest revisions of relevant Indian standards.

7.3.3.6 EARTHING

1) **SCOPE**

This specification covers the supply, installation testing and commissioning of earthing system for complete 5.0 Mw or nearby wind power project including power evacuation system**.**

2) **STANDARDS**

Earthing covered by this specification shall unless other wise stated be in accordance with the latest revisions of relevant Indian standards.

IS :3043	: code of practice for earthing
Indian electricity rules	: 1956
Indian electricity Act	1910
CEIG/CEA regulation	

3) GENERAL REQUIREMENTS

The equipments and building shall be provided with compete earthng System comprising earth electrodes in conjunction with earth grid as specification.

4) DETAILS OF EARTHING SYSTEM

Unless otherwise specified main earth conductor shall not be less than 52 x 6 mm GI flat. The minimum size if earthing conductor of various equipments shall be as follows.

a) Transformer neutral	- 50 x 6 mm Cu
b) Transformer body, vcb kiosk Switchboards. Distribution boards Structures etc**.**	- 50 x 6 mm Cu

5) EARTH ELECTRODE

38 mm dia GI pipe electrodes2.5 m long shall be used as earth electrode suitable funnel arrangement shall be made at the mouth of the pipe for watering the electrode shall be enclosed in a brick work earth pit with suitable cast iron /RCC covers. Each earth electrode shall have disconnecting link provision for individual testing of the electrode. If earthing resistance of less than on Ohm is not achieved with 2.5 m deep electrodes then deeper earth electrodes up to water table, even boring and by burying 2 nos of 38 mm dia rod, with coke/charcoal /salt to achieve the necessary earth resistance. Hence bidder shall indicate separately the rate for this deep bore electrode on per meter basis as called for in the price schedule.

Coke/charcoal/salt shall be used to achieve the necessary earth resistance. Electrodes shall be as per IS:3043

Earth electrode shall be erected 1.5 mts away form the buildings edge and minimum spacing between the electrode shall be maintained as per IS:3043

6) ERECTION OF EARTHING CONDUCTORS

Earthing conductors in outdoors areas shall be buried at least 600 mm below finished ground level unless stated otherwise. If the equipment is not available at the time of laying the grid then " earth riser" shall be provided near the equipments foundation/ pedestal for future connection to the equipment earthing terminals. Earthing conductors along their run on ladder columns, beams, walls. etc. shall be supported by suitable cleaning at intervals of 750 mm . Cable supports shall be connected to the main earthing conductor. Wherever it passes through walls floors etc. GI sleeves shall be provided for the passage of the conductor.

7) JOINTING

Earthing connecting with equipment earthing pads shall be of bolted type only. Contact surface shall be free from scale, paint, enamel, grease, rust or dirt. Two bolts shall be provide for making each connection. Bolted connections after being checked and tested shall be taped with Pvc tape.

Resistance of the joint shall not be more than the resistance of the equipment length of the conductor**.**

7.3.3.7 ERECTION, TESTING & COMMISSIONING

1) Erection – Scope

This specification covers of all electrical equipments and accessories for efficient and trouble free operation of complete electrical system covered by this specification.

2) General Requirements

a) An electrical contractor holding a valid license as required by the state government authorities shall carry out the installation.

b) The contractor shall provide necessary drawings and documents required by statutory authorities and obtain safety certificate / approval from local statutory authorities.

c) Any modification in the equipments or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost to the owner.

d) In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the owner the successful bidder shall unload, assemble, erect, install, test, commission and hand over all electrical equipments included in this contract.

e) Erection material including all consumables, tools, testing, instruments or any other equipment required for successful commissioning shall be arranged by the successful bidder in a timely manner.

f) Clearing the site after completion of erection as well as regular clearance of unwanted materials from site, returning excess materials supplied by the owner back to owner's stores shall also be included under this scope of work.

g) The contractor shall carry out major civil engineering works as called for in scope of work pertaining to electrical equipments like foundation plate inserts etc. As per the latest relevant drawings as sell as carry out minor civil works such as but no limited to the grouting of base plates, channels supports and foundation bolts, cutting holes in wall and ceiling, chipping of floor and ceiling and making good the same after installation of the equipments and any other minor civil work awarded by owner for completion of the work has to be carried out without any extra charges**.**

3) Equipment erection

a) Power transformer 33 kV outdoor VCB kiosk etc shall be handed and erected as per the relevant codes of practice and manufacturer's drawings and instruction manuals.

b) For power, the contractor shall carry out transformer, dying out and oil filling as required, after checking and testing the dielectric strength. If required, oil filtrations shall be carried out by the contractor before commissioning at no extra cost.

c) During erection care is to be taken to see that painting does not peel of at any place and if so it has to be given touch –up after erection by the contractor

4) CABLE LAYING AND TERMINATION

SCOPE

This specifications covers the excavation and back frilling, laying, jointing, testing at sit and termination of LT power cable, control cables% screened power cable.

a) All cables shall be installed on accordance with the relevant standards and as per cable manufacturer's recommendations.
b) Open ends of cable shall effectively seal immediately after cutting to prevent ingress of moisture and to avoid other contamination.
c) The vending radius of all cables shall not be more than the manufacturer's recommended minimum value.
d) Any damage to cable shall be reported immediately to owner/consultant who will advice the actions to be taken work is continued**.**

5) CABLE ROUTES

a) Underground cable shall be identified by markers of the type shown on the drawing. Route market's shall be positioned at10 m intervals on straight rein. At all points where there is a change in direction and in the manner shown in the drawings . similar markers shall be suitably located to indicate the position of all underground joints. Cost of supplying and installation of cable rout markers shall be included in cable laying cost.

b) Cables shall be segregated if required

6) INSTALLATION OF DIRECTLY BURIED CABLES

a) Cables laid directly in open ground shall be buried at a depth not less than the following
Power cables upto and including 1100V-750 mm
b) Cables trenches shall be of a size to cater suitably for the number of cable to be installed in them.
c) Wherever practicable cable installation shall not commence until the cable trench has been excavated along the complete cable route. Where this procedure is not possible a cable laying programme shall be agreed with the project manager or engineer authorized by the project manager.
d) Cable trenches shall be free from abrasive materials and shall have a 100mm deep sand base before cable installation commences. Cable shall be laid over a sand cover of at least 75 mm thick. Layer of brick shall be laid over the cable and sand cushion to prevent mechanical damage of the cable

e) Back filling of cable trenches shall be in graded layers each layer being well competed the soil originally removed form the trench may be used for back fill.

f) Extra length of at least 2 loops shall be kept in each cable run at each end to enable one or two straight through joints to be made at a later date if any fault occurs.

g) At road crossings the cable shall be taken in Hume pipes of adequate size. The rate shall be quoted separately

7) CABLE GLAND AND JOINTING

a) At cable terminations/joints the cable conductors shall be fitted with correctly sized preferably of the double compression type glands for outdoor

b) All compression termination shall be made using the correct size crimps and connectors.

c) Earth continuity of cable Armour/ sheath and glands must be assured upon completion of jointing all cable Armour and glands should be earthed with No SWG Cu wire and by using correct size sockets.

d) All cable jointing procedures shall be in strict accordance with the cable and cable jointing kit manufacturer's recommendations.

e) Cable jointing on lead covered and armored cable shall be carried out using a standard cast iron box and wiped lead sleeve. the box should fit with Armour clamps

f) Jointing on cable shall carried out using suitable resin jointing kits as recommended by manufacturer.

g) Correct core identification of cable joints shall be maintained throughout all the joints without undue twisting and crossing of conductor covers.

h) The crossing of cable covers in equipment termination boxes shall be avoided

8) TESTING

a) For cable upto1100 V grade 500./1000 V insulation tester.

b) All cable shall be tested as per the relevant Indian standards

c) Cable schedule and cable layout drawing shall be corrected to "As-built " condition during the installation work and shall be approved by the owner /consultant

d) any rework arising on account of the remarks made by the statutory authorities shall be carried out by the contractor at free of cost.

9) OVERHEAD LINE INSTALLATION

Installation of 33KV overhead line system involving single pole double pole three pole structure with cross arm supports for AB switch. Do fuse etc shall be as per relevant IS/CBIP/REC practices of latest issue and as called for in the specification electrical clearance shall be maintained as per IE rule /MPSEB/MP transmission co/DISCOM practice. Only calculated conductor sag shall be maintained throughout the overhead line overhead line structures. Earthing and foundation shall be as shown in the relevant general arrangement drawings appended with this specification.

10) EARTHING

GENERAL

a) Earthing system installation shall be in strict accordance with the latest editions of Indian standards and code of practices and the local statutory authority regulation.

b) Neutral points of system metallic enclosures and frame works not forming part of electric supply shall be connected to main

c) **EARTHING LAYOUT**

The contractor shall submit to owner /consultant earthing drawings showing the location of earthing conductors for their approval. Earthing conductors in outdoor areas shall be buried 600 mm below finished graded level and theses buried conductors shall be brought 500 mm above ground level for making tap connections to the equipments.

d) **TRANSFORMER EARTHING**

Two separate earthing electrodes shall be provided for transformer neutral and on earthing electrode for transformer body earthing. Apart from body earthing control cubicle and radiator shall also be properly earthed. All the electrodes shall be 38 mm dia GI pipe 2.5 m long an shall strictly be as per IS:3043 of latest revision.

e) STRUCTURE EARTHING

1) Each phase of 27 KV LA shall be earthed to an individual earth electrode through 50 x 6 mm GI flat.
2) Air break switches and DO fuses shall also be earthed through 50 x 6 mm GI flat t o the main earthing flat.
3) Two poles and three-pole OH line structure (with AB switches and D/O fuses) shall also be earthed to 2 No of earth electrodes.
4) For singly pole OH line structure shall be earthed with coil earthing as specified in the relevant specification shall be adopted.
5) Metallic condition and pipes shall not be used as earth continuity conductor 8 SWG GI conductors shall be provided for earthing and this conductor in turn shall be connected to the main earthing conductor / electrode.

11) SPECIFICATION FOR TESTING & COMMISSIONING

General requirements

The resting and commissioning for all electrical equipment at site shall be according to the procedures listed below:

a) All electrical equipment shall be tested installed and commissioned in accordance with the latest relevant standards and code of practices published by Indian standards institution wherever applicable and stipulation made in relevant general specification.

b) The testing of all electrode equipments as well as the system as a whole shall be carried out to ensure that the equipment and its components are in satisfactory condition and will successfully perform its functional operations the inspection of the equipment shall be carried out to ensure the all materials workmanship and installations conform to the accepted design, engineering and construction standards as well as accepted code of practices and stipulation made in the relevant general specifications.

c) All tests shall be carried out by the contractor in the presence of Owner / consultant using his own calibrated instruments testing equipment as well as qualified testing personnel.

d) The results of all tests shall conform to the specification requirements as well as any specific performance data guaranteed during finalization of the contract.

12) PREPARATION OF THE PLANT FOR COMMISSIONING

a) After completion of the installation at site and for the preparation of plant commissioning the contractor shall check all the equipment and installation in accordance with the agreed standards. Latest relevant code of practices of Indian standards and specific instructions furnished by the particular equipment supplier as well as purchaser.

b) checking required to be made on all equipment and installations at site shall comprise but not limited to the following:

1) Physical inspecting for removal of any foreign bodies , external defects such as damaged insulators loose connecting blots loose foundation blots etc.
2) Checks for grease insulating/lubricating oil leakage and its proper quality.
3) check for the free movement of mechanism for the circuit breaker rotating parts of the rotating machines and devices
4) check for tightness of al cable joints and bus bar termination ends as well as earth connection in the main earthing network.
5) check for clearance of live bus bars and connectors from the metal enclosure
6) check for proper alignment of all draw out device like draw out type circuit breaker etc
7) continuity check in case of power and control cable

8) Checking of all mechanical and electrical interlocks including tripping of breakers using manual operation of relay
9) Checking of alarm and annunciation circuits by manual actuation of relevant relays like Buchhloz relay in case of transformer.
10) Check and calibrate device requiring field adjustment/calibration like adjustment of relay setting etc.
11) Check for proper connection of earth network of all non-current carrying parts of the equipment and installation.

13) The relevant tests shall e carried out in accordance with relevant IS of latest issue. The tests which are to be carried out on the equipment shall include but not be limited to the following:

a) 33KV STEP UP TRANSFORMER

- Measurement of winding resistance at all taps
- Measurement of voltage ratio on all taps.
- Vector group check
- Measurement of impedance voltage/ short circuit impedance (at principal tapping)and load loss.
- Measurement of no load loss and current
- Measurement of insulation resistance.
- Power frequency withstand test.
- Operational tests to know the correction functioning of all devices associated with the transformer.

b) 33 KV OUTDOORS SWITCHGEAR KIOSK

- Check for completeness
- Insulation resistance test
- Contact resistance test
- Check for pick up voltage of operating coils
- Operation checks for local /remote protective trip
- Operation timing test: - closing time
  - opening time
- Pressure switch setting open close checking
- Operating duty check for o-c-o
- Function checks on control circuit auxiliary switch ON/OFF indicator operation counter, spring charge/ remote trip indication, operation counter, heater/heater switch and illumination lamp.
- Relay operation test and check on settings

c) LIGHTING ARRESTER

1) Check for completeness of installation
2) Each pole to earth insulation resistance test

d) AIR BREAK SWITCH

1) Check for completeness of installation

2) Insulation resistance test

a) Pole to earth
b) Control cables
c) Manual operation checks.

e) CABLE

1) Insulation resistance test with 2,500 V meager for high voltage power cable rates above 1.1KV grade and 1,000 grade meager for cable rated unto 1.1 KV grade
2) all 1.1 KV cable shall be subjected to high voltage test after joining and terminating but before commissioning as per relevant standards
3) in each test the metallic sheath/screen Armour should be connected to earth.
4) Continuity of all the cores correctness of all connection as per wiring diagram, correctness of polarity and phasing of power cable and proper earth connection of cable glands, cable boxes Armour and metallic sheath shall be checked.

e) EARTHING SYSTEM

h) Test to ensure continuity of all earth connections
i) Tests to obtain earth resistance of the complete network by using earth tester. The test values obtained shall be with in the limits

7.3.3.9 **SITE TEST REPORTS**

All documents/ records regarding test data, oscillagraphs and other measured values of import ants parameters finalized after site adjustments shall be handed over to purchaser in the form of test reports (in bound volume) for their future use and reference

7 .4 **OPERATION AND MAINTENANCE**

7.4.1 SCOPE

MOIL wishes to entrust the total O&M activities of the 15.0 MW or nearby capacity wind farm to the turnkey contractor for the first 20 (twenty) year.

The Turnkey contractor shall be responsible for all the required activities for the successful running, guaranteed energy generation & maintenance of the wind farm including wind farm electric's covering.

1) Deputation of engineering and supporting personnel
2) Deputation of security personnel
3) Successful running of WEG(s) for guaranteed maintaining of records registers
4) Monitoring controlling trouble shooting maintaining of record, register
5) Supply of all spares, consumables and fixing /application of the same as WEG(s).

6) Supply & use of consumables such as grease oil etc throughout the maintenance period as per recommendation of the equipment manufacturers
7) Conducting periodical checking testing overhauling and preventive action
8) General up keeping of all equipments, building, roads wind farm land area.
9) Submission of periodical reports to MOIL/DISCOM on the energy generation & operating condition of the wind farm.
10) Taking care of all security aspects of the wind farm.
11) Replacement of capacitor if burnt.

7.4.2 Continuous monitoring the performance of he win electric generators and regular maintenance of the whole system including WEG, transformers, overhead line, outdoor kiosks etc. are necessary for extracting and maintaining the maximum energy output from the wind farm.

7.4.3 Operation and maintenance of the wind farm including supply of spares and consumables required for a period of first 2(two) plus 18 (eighteen) years from the date of commission of the project shall be carried out at fixed cost. The period of operation and maintenance will be deemed to commence with effect from 2 years form the date of commissioning of complete wind power project.

7.4.4 OPERATION AND PERFORMANCE MONITORING

Operation parts consists of deputing necessary manpower necessary to operate the wind farm at the optimum capacity. Operation procedures such as preparation to staring running routine operations with safety precautions monitoring etc shall be varied out as per the manufacturers instruction to have trouble free operation of the complete system.

Daily work of the operators in the wind farm involves logging the voltage, current, power factor ,power and energy output of the 15.0MW or nearby capacity wind farm logging down individual WEG(s) output data once a day (minimum).The operator shall also note down failure interruptions in supply and tripping of different relays reason for such tripping ,duration of such interruption etc the other task of the operators is to check battery voltage specification gravity and temperature.

The operator shall record monthly energy output of each WEG and reports shall be prepared on performance of wind farm indicating turbine wise production. Down time, capacity factor machine availability etc, and these figures shall be computed for the total wind farm.

7.4.5 MAINTENANCE

The contractor shall draw the preventive maintenance schedules and attend to the breakdowns keeping in view than machine availability shall be always more than 98%.

The contractor shall carry our the periodical/plant maintenance as given in the manufacturers service manual and perform minimum two certified services per year.

Maintenance of other major equipment involved in wind farm electric are step trans formers overhead line equipment and outdoor 33 KV VCB /SF6 kiosk and metering panel . particular care shall be taken for outdoor equipment to prevent corrosion. Cleaning of the insulators and applying Vaseline on insulators shall also be carried out at every 3 to 4 months interval. Resistance of the earthing system as well as individual earth are to be measured and recorded every month. If the earth resistance is high suitable action is to be taken to bring down the same.

A maintenance record is to be maintained by the operator/engineer in charge to record the regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance reasons for the breakdowns steps have taken to attend the breakdown duration of the breakdown etc.

The schedules will be drawn such that some of the jobs other than breakdown which may require comparatively long stoppage of the WEG's shall be carried out preferably during the non windy season .

All the old /damaged spares removed shall be handed over to MOIL.

The contractor will deploy enough manpower at wind farm site to carryout work instruction and preventive maintenance schedules as specified. The contactor shall keep at least one skilled and experienced supervisor at site on permanent basis to supervise the jobs that are being carried out at site.

The contractor will attend to any breakdown jobs immediately gor repair\replacement adjustments and complete at the earliest working round the clock. During breakdowns (not attributable to normal wear and tear) at O&M periods the contractor should do needful in claiming insurance, follow-ups, documentation for insurance authority replacement of the failed equipment and successful commissioning .

The contractor shall at his own expense provide all amenities to his workmen as per applicable laws and rules.

The contractor shall ensure that all safety measures are taken at the site to avoid accidents to his or his co contractor.

If any jobs covered in O&M scope are not carried out by the contractor during the O&M period pro-rata deduction will be made based on the quantum of work from the O&M contract bills.

7.4.6 EFFORTS TO INCREASE THE EFFICIENCY

The contractor shall take efforts to make the system more efficient by adopting methods like adjustment of pitch angle. Power factor improvement reducing reactive power consumption use of right grade of lubricants etc.

7.4.7 TOOLS AND TACKLES

The contractors shall arrange for all the necessary tools and tackles including crane for varying out all the maintenance work covered under this contract.

7.4.8 INSPECTION & TRAINING PROGRAMME:

Pre-dispatch inspection of equipment to determine performance by two MOIL engineers at manufacturers /collaborators end shall be arranged by the contractor. The contractor shall also arrange seven days training progeramme for two MOIL engineers for errection commissioning of the equipment at manufacturer /collaborators works and site during installation of equipment. During training the contractors shall familiarize MOIL personal with the wind electric generator operation as well as other electrical equipment associated with the wind farm. All the expenses towards this shall be borne by the contractor.

7.4.9 O & M MANUAL

The contractor has to provide at least 6 copies of the O&M manual in English along with list of suppliers of different components of the WEG.

7.4.10 DEFECTS & RECTIFICATION

The engineer in charge has the responsibility to check the contractor ‘s work and verify the works are completed as per specification and if the he found And defects in the woks the contractor has to rectify the defects with in the time schedules specified by the engineer in charge.

Even if the engineer charge instructs the contractor to carry out a test not specified int the specification to check whether any work has a defect and the test shows that it does the contractor is to pay for the test and any samples. If there is no defect the test is a compensation event.

The contractor is to correct defects which he notices himself before the end of the warranty and guarantee period as contractual obligation and also shall assist the employer in rectification of any defect beyond the warranty and guarantee period for best and prompt result.

7.4.11 ACCIDENTS

MOIL will not have any liability towards any loss or damage to the property or personal of the contractors deployed for discharging the work under this contract.

7.4.12 CONFIDENTIALITY

All data recorded /taken form the wind farm will be proprietary item of MOIL and shall not be part to any person /agencies without written consent form MOIL.

7.4.13 SECURITY SERVICES

The contractor has to arrange proper security system including deputation of security personnel at his won cost for the check vigil for the wind farm during the complete O&M period 20 years. The security staff may be organized to work on suitable shift system proper checking & recording of all incoming & outgoing material vehicle shall be maintained. Any occurrence of unlawful activities shall be informed to MOIL immediately, a monthly report shall be sent to MOIL on the security aspects.

7.4.14 ORGANIZATION CHART

The bidder shall furnish an organization chart for the proposed O&M period. The periodic person responsible for reposting to MOIL shall be indicated by designation.

MONTLY PERFORMANCE REPORT FOR WEG

Name of the win power projects :
Location : state :
Month : year :

Month
1) Unit size :
2) Nos :
3) Model :
4) Date of commissioning :
5) Total machines hrs :

Date	Daily generation in KWH	Generation Hrs	Down time hours						Remark
				Machine		Grid		total	
			Inadequate wind speed	fault	Shutdown/ maintenance	fault	Shutdown /maintenance		
1	2	3	4	5	6	7	8	9	10
1									
2									
30									
31									
Total									

MONTLY PERFORMANCE REPORT FOR WEG

Name of the win power projects :
Location : state :
Month : year :

Month
1) Unit size :
2) Nos :
3) Model :
4) Date of commissioning :
5) Total machines hrs :

Date	Daily generation in KWH	Generation Hrs	Down time hours						Remark
				Machine		Grid		total	
			Inadequate wind speed	fault	Shutdown/ maintenance	fault	Shutdown /maintenance		
1	2	3	4	5	6	7	8	9	10
1									
2									
30									
31									
Total									

Total Monthly generation (lakh k Wh) :

Total Monthly energy exported (lakh k Wh) :

Capacity factor for the month :

Availability factor for the month :

Cumulative /generation in the financial year (lakh k Wh) :

Generation in the same month in the previous year (lakh k Wh):

Percentage of previous year's generation in the same month:

Individual machine performance

M/c No	Monthly generation KWH	Generation time (Hrs)	Inadequate wind speed (Hrs)	Monthly M/c down time (Hrs)	Monthly grid down time (Hrs)

Notes :

1. Total machine Hours = No of machine X Hours in the month Actual energy generation.

2. capacity factor(CF%) = Installed capacity X no of hours in the month hours. Machine available for generation.

3. Availability factor(AF%) = Total machine hours in the month

Total machine hours. In the month machine down time hours

= Total Machine hours in the month.

4. information for different types size of machine installed in the wind farm should be complied separately.

Monthly energy generation chart for wind farm (….. MW)

Month : WEG Make & Rating :

Year :

Date	Energy generation in KWH				Daily total energy generation in KHW	Cumulative energy generation	Remark
	M/C-1	M/C-2	M/C-3	M/C-4			
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							

Financial and technical parameters of the organization
(To be furnished by the bidder)

Name and address of the bidder ----------

Phone E-Mail Fax:

1. Financial

1. latest balance sheet field with _____ on_____ (attach audited copies of annual accounts of past 3 years. Indigenous bidder to attach copy of accounts audited under section 44 AB of income tax act. In case the account are not required to be audited . the information in this statement should be attested by a charted accountant or manger of a nationalized bank.)

2. latest profit and loss statement from _____ to _____ field with _____ on _____ (attach an audited copy.)

3. Financial position (in the respective currency):
   a) Cash & bank balance
   b) Fixed assets – gross and net
   c) Current assets
   d) Current liabilities bank
      Bank cash credit
      Other (including sundry creditors)
   e) Provision s
   f) Contingent liabilities (including claims not acknowledged, please specify.)
   g) Inventories.
   h) Share capital
      Free reserves
      Other reserves
      (Please Specify)
   i) Term loan from financial institution and banks
   j) Working capital
   k) Net worth
   l) Debtors and advances considered good:
      More than 6 months
      Less than 6 months

4. Total liabilities

a) Current Ratio: current assets to current liabilities
b) Acid test ration: cash temporary investment held in lieu of cash and current receivables to current liabilities.
c) Total liabilities to net worth

5. Net sales (in respective currency)

a) Current period
b) During the last financial year
c) During the year before last financial year

6. Net profit before tax.

a) Current period
b) During the last financial year
c) During the year before last financial year

The profit and loss statement have been certified through…… by

7. Bidders financial arrangement (check appropriate item).

a) Own resources
b) Bank creditors
c) Others(specify)

8. Certificate of financial soundness from bankers of bidders

9. Income tax clearance:

Please enclose the copies of the following documents:

a) Details of income tax registration and
b) Last income tax clearance certificate

10. Sales

Category	values of current orders to be Executed in respective Currency	values of anticipated sales for next financial year in respective currency
A.	Govt. Department	
B.	Commercial	

11. Technical

1. Bidder's classification
   1) manufacturer
   2) Authorized Agent
   3) Dealer
   4) Other (please Specify)

2. Licensed capacity to manufacturer:

Description of equipment	Size capacity	Licensed capacity	No of units manufacture		
			Current year	Last year	Second last year

3. Plant details
   a) Location
   b) Description, type and size of building
   c) Is property on lease or free hold? If in lease, indicate date of expiry In each case.

4. Personnel /organization:
   Give organization chart for following indicating clearly the number of employees at various levels.

   a) Production
   b) Marketing
   c) Installation and commissioning
   d) Service
   e) Spare parts
   f) Administrative

5. a) type of equipments manufactured/installed during last 5 years

Name of equipment	Capacity/size/model	Nos manufactured/supplied/installed	Project to which supplies were made	No. of orders in hand

6. list if any of bidders rate contract with the following organization (for India's only)

	Organization	yes/no	if yes, date contract finalized
a)	Directorate general of Supplies and disposal Government of Indian		
b)	Central equipment stores Purchase organization for State government.		

7.

	Plant facilities	**Sq metre**	**Remarks**
a)	Space available for manufacture		
b)	Space available for storage		
c)	Space availability for inspection of item offered		
d)	Space availability for storage of items offered		
e)	Are buildings fire resistant	yes/no	
f)	Are premises approved by municipal fire department		yes/no
g)	Are building under municipal fire protection		yes/no
h)	Are power and fuel adequate to meet production Requirement	yes/no	
i)	Are adequate transportation facilities available	yes/no	
j)	Are safe measures adequate for performance of Proposed contract	yes/no	
k)	Are adequate material handing equipment	yes/no.	

8. Details of testing facilities available:

a) List testing equipment available
b) Give details of test which can be carried out on items offered.
c) Details of test organization available.

9. Describe quality control organization, if any give the organization chart

a) Are goods offered subject to batch test, random sampling or full 100% test qualified?
b) Are test carried out by factory employees or by a separate testing agency?
c) Are independent quality control organization check made and certificates issued?

10. **Nearest service centre to buyer** :

Location ……. Phone No……

11. Details of organization at service centre

a) No. Of skilled employees
b) No of unskilled employees
c) No of engineer employees
d) No of administrative employees.
e) List of special repair/workshop facilities available
f) The storage space available for spare parts
g) Value of minimum stock spares available at all the service centre in respective currency.
h) List of models/types by number of equipment serviced by the centre in last 5 years.

12. Name of two whom similar equipment are supplied installed and commissioned in the part and to whom reference may be made …… regarding the bidders technical and delivery ablity .

a) ……..
b) ……..

13. List of companies usually subcontracted

14. Schedules for furnishing technical data and certified drawing after receipt of order.

15. Workload as percentage of total capacity for the current and forthcoming financial year on quarterly basis.

Signature & seal of bidder

APPENDIX

List of similar jobs handled in the state of Maharashtra

Sr No	Client name, address& telephone/fax number	Details of work & place	Rating &Qty	Value of work	Completion time as stated in bid	Actual completion time	Year of commissioning
1	2	3	4	5	6	7	8

Note :

1) Furnish performance report completion report or any other authentic supporting document.
2) Furnish for WEG (which are offered under this RIP) latest performance report form state electricity board /client certifying the successful operation for the period since commissioning

Signature & seal of bidder

Appendix-A

PRICE SCHEDULE – SUMMARY
EPC (BOT) CUM O&M OF 3.0 MW OR NEARBY CAPACITY WIND POWER PROJECT IN MAHARASHTRA FOR CAPTIVE USE AT …… SITE PROPOSED BY BIDDER
(To be furnished by the bidder)

	Name of work	Amount (Rs)	
		In figures	In words
1.	EPC of 3.0 MW or nearby capacity wind power project at…….. in Maharashtra complete in all respect (lump sum price). (Cost shall be including but not limited to the cost of WEG including cost of land, machine nacelle assembly, generators, blades, tower, transformer, control panel, monitoring and control system and cost of internal and external 33kv lines interfacing with grid sub station, micro-site transportation, erection and commissioning civil works and all other works enabling wind power project work completer in all respect including wind monitoring station and free operation and maintenance for two years after successful commissioning of win power plant as per scope of work.		
2.	Operation and maintenance of 3.0 mw or nearby capacity wind farm for twenty consecutive year including cost of comprehensive insurance, consumables deployment of manpower and spares.		
	Sub total (1+2)		

Grand total (contract sum)Rupees……

Note:

1. The lump sum price shall include cost of any item of work not mentioned specifically in the above particular, but written elsewhere in the scope of work or in technical or essential required for completion of work proper operation and maintenance of wind farm safety of equipment and operating personal shall be deemed to have included in the above particulars .

2. The bidder is required to furnish the break up of quoted lump-sum price as per appendix. However ,supplier to note that this is not items rate contract nor schedule of rates. All works ,which are deemed to be performed, executed and supplied by suppliers as stipulated in the bid and its cost thereof should be covered suitable and appropriate assigned to various available heads and categories. Non-familiarity and non-identification of any works will no be considered a reason either for extra claims or not carrying out the works in the strict conformity withdrawing. Specification and instructions of engineer in charge.

3. The comprehensive insurance charges for the wind farm as well as machinery break down which shall be borne by owner and the contractor shall arrange insurance every year from the date of commissioning and claim the same for reimburse against proof. Where as the cost of insurance up to the date of commissioning is to be born by the contractor

4. The price mentioned here above shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids should be ignored while evaluation the bids.

Signature of bidder
With company Seal

APPENDIX-A-1

Price schedule –details of 3.0 MW Wind Energy Farm for Captive Use.

Sr.no	Description of item /work	Quantity	Units Price (Rs)		Total Price	
			In figures	In words	In figures	In words
1.	Land					
2	Infrastructure dev charges					
3	Civil works					
4	WTG					
5	Electrical equipments					
6	Instrument & control					
7	Other equipments					
8	Misc. exp.					
9	Errection, inst,comm.&Charges					
10	**Grand total**					

The above prices are firm till the completion of the contract. The prices are inclusive of all taxes, levies, duties, octroi, delivery charge to site, transportation loading, unloading, insurance etc.

Date…….

Note: use addition sheets of the same format, if required

Signature of bidder
With company seal

Appendix - B

PRICE SCHEDULE – SUMMARY
EPC (BOT) CUM O&M OF 5.0 MW OR NEARBY CAPACITY WIND POWER PROJECT IN MAHARASHTRA FOR SALE TO UTILITY AT …… SITE PROPOSED BY BIDDER
(To be furnished by the bidder)

	Name of work	Amount (Rs)	
		In figures	In words
1.	EPC of 5.0 MW or nearby capacity wind power project at…….. in Maharashtra complete in all respect (lump sum price). (Cost shall be including but not limited to the cost of WEG including cost of land, machine nacelle assembly, generators, blades, tower, transformer, control panel, monitoring and control system and cost of internal and external 33kv lines interfacing with grid sub station, micro-site transportation, erection and commissioning civil works and all other works enabling wind power project work completer in all respect including wind monitoring station and free operation and maintenance for two years after successful commissioning of win power plant as per scope of work.		
2.	Operation and maintenance of 5.0 mw or nearby capacity wind farm for twenty consecutive year including cost of comprehensive insurance, consumables deployment of manpower and spares.		
	Sub total (1+2)		

Grand total (contract sum)Rupees……

Note:

5. The lump sum price shall include cost of any item of work not mentioned specifically in the above particular, but written elsewhere in the scope of work or in technical or essential required for completion of work proper operation and maintenance of wind farm safety of equipment and operating personal shall be deemed to have included in the above particulars .

6. The bidder is required to furnish the break up of quoted lump-sum price as per appendix. However ,supplier to note that this is not items rate contract nor schedule of rates. All works ,which are deemed to be performed, executed and supplied by suppliers as stipulated in the bid and its cost thereof should be covered suitable and appropriate assigned to various available heads and categories. Non-familiarity and non-identification of any works will no be considered a reason either for extra claims or not carrying out the works in the strict conformity withdrawing. Specification and instructions of engineer in charge.

7. The comprehensive insurance charges for the wind farm as well as machinery break down which shall be borne by owner and the contractor shall arrange insurance every year from the date of commissioning and claim the same for reimburse against proof. Where as the cost of insurance up to the date of commissioning is to be born by the contractor

8. The price mentioned here above shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids should be ignored while evaluation the bids.

Signature of bidder
With company Seal

APPENDIX-B-1

Price schedule –details of 5.0 MW Wind Energy Farm for Sale to Utility.

Sr.no	Description of item /work	Quantity	Units Price (Rs)		Total Price	
			In figures	In words	In figures	In words
1.	Land					
2	Infrastructure dev charges					
3	Civil works					
4	WTG					
5	Electrical equipments					
6	Instrument & control					
7	Other equipments					
8	Misc. exp.					
9	Errection, inst,comm.&Charges					
10	**Grand total**					

The above prices are firm till the completion of the contract. The prices are inclusive of all taxes, levies, duties, octroi, delivery charge to site, transportation loading, unloading, insurance etc.

Date…….

Note: use addition sheets of the same format, if required

Signature of bidder
With company seal

APPENDIX

TECHNICAL PARTUCULARS OF WEG

(To be furnished by the bidder)

Sr.no	Description	Particulars to be provided by
1.	**General date**	
a)	Wind speed rated output(m/sec)	
b)	Cut in wind speed(m/sec)	
c)	Cut out wind sped(m/sec)	
d)	Tip speed (m/sec)	
e)	Survival wind speed (m/sec)	
f)	Hub height(m)	
G)	Rotor speed(rpm)	
h)	Nacelle tilt angle	
i)	Regulation	
j)	Voltage variation(%)	
k)	Frequency variation (Hz)	
l)	Frequency (Hz)	
m)	Asymmetry variation	
n)	Current (amps)	
o)	Rated output (kw)	
p)	Make of WEG	
q)	Type	
2.	**Weight**	
a)	Rotor (kg)	
b)	Nacelle (kg)	
c)	Tower(kg) Total(kg)	
3.	**Gear box**	
a)	Type/model	
b)	Gear ratio	
c)	No of steps	
d)	Max power transmission (kw)	
e)	Lubricants	
4.	**Generator**	
a)	Rated power output(kw)	
b)	Type (dual wound/2generators)	
c)	Voltage	
d)	RPM	
e)	No of poles	
e)	Inslulation class	
g)	Protection	
h)	Coupling	
i)	Current (AMPS)	

j)	Frequency (Hz)	
5.	**TOWER**	
a)	Height(m)	
b)	Type	
c)	Material	
d)	No of sections	
e)	Assembling	
f)	Ladder tupe	
g)	Safty system	
h)	Surface treatment protection	
6.	**Yawing system**	
a)	Type	
b)	Gear box ratio	
c)	Yawing motor (kw)	
7.	**Break system**	
a)	Aero – dynamic	
b)	Mechanical	
8.	**Rotor**	
a)	Blade material	
b)	Make	
c)	Number of blades	
d)	Rotor diameter (m)	
e)	Swpet area (sqm)	
f)	Length (m)	
9.	**Power factor comsumption**	
a)	Capacity (kvar)	
b)	Number	
c)	No of steps	
10.	**Orientation**	
11.	**Annual output per weg (kwhr)**	

Signature & seal of bidder

Technical particulars of 33 kv et-up transformer
(to be furnished by the bidder)

S.no	Description	Guaranteed particulars to be filled in by the
1.	services	
2	Type	
3.	Rating Kva	
4.	Rated frequency Hz	
5	Number of phase HV side LV side Neutral (separate outside)	
6	Rated voltage a)HV winding Kv b)LV winding Kv	
7	Vector group	
8	Type of cooling (onan/onaf)	
9	Insulation level a)power frequency withstand –kv rms (HV/LV) b)inpluse withstand voltage –kv ((HV/LV)	
10	Method of earthing	
11	Duty	
12	Short circuit level	
13	Off circuit tap changer a)range b)insteps of c)tapping provided on HV side	
14	Tap changer type	
15	Impedance voltage at 75^0 C a) at principal tapping	
16	Temperature rise above 50^0 C ambient a) top of oil by thermometer b) womdomg bu resostamce	
17	Terminal details a) HV side b) LV side	
18	Losses (at 750 C and principal tapping a)no load loss at rated voltage kW and frequency b) load loss at rated currend kW (ONAN) c) total loss at maximum rated power kW	
19	Efficient at 75^0 C and 0.9 PF a) at full load (ONAN) %	

	b) at 75 % load (ONAN) % c) at 50 % load (ONAN) %	
20	Host spot temperature in winding limit to ^{0}C	
21	Shipping dimensions a) height m b) Breath m c) Length m	
22	Painting	
23	Reference standards	

Technical particulars of 33 kv et-up transformer
(to be furnished by the bidder)

S.no	Description	Guaranteed particulars to be filled in by the
1.	services	
2	Type	
3.	quality	
4.	Nominal system voltage kV	
5	highest system voltage kV	
6	Busbars a)No of phase b)rated frequency Hz c) continuous current rating A d) fault level MVA e) material f) maximum permissible temperature rise at rated normal current above ambient temperature of 50^0 C	
7	System earthing	
8	Duty cycle	
9	Insulation level a)power frequency withstand –kv rms b)impulse withstand voltage –kv peak	
10	Operating voltage a) trip coil (through power pack) b) closing coil (through power pack) c) spring charging motor	
11	Number of spare auxiliary contracts	
12	Sheet steel thickness a) gland plate vase frame & all other action b) cable entry c) gland plate	
13	Enclosure protection	
14	Main eath bus a) metrial b) Size	
15	Voltage transformer a) type b) ratio c) burden d) class	
16	Current transformer a) ratio	

	b) core II	
17	Gasket type	
18	Control wiring	
19	Painting	
20	Panel size LxBxH mm	
21	Panel weight Kg	

appendix

Deviation schedule

Bidder's Proposal Ref No and Date
Bidders name and address

To,

Sr. Dy General Manager (Elect&PP)
Manganese Ore (India) limited,
Nagpur

Dear Sir
We declare that the following are the only deviation and variation from and exception to the specification contained in bid document no…….. date…….. for setting up 15.0 MW or nearby capacity win farm project at …….. in Madhya Pradesh. The schedule has been filled ,except these deviations subject to the approval and acceptance by MOIL. The entire work shall be performance as per your specifications and documents. Further we agree than t addition condition if any found elsewhere in our offer than those stated below other than pertaining to any rebates offered shall not be given effect to.

Claus no	reason	page	statement of variation And deviations

Signature & seal of bidder

Note use addition sheets of the same format if required.