(A Govt. of India Enterprise)
2A District Shopping Center, NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

E-mail: bhavik_mody@oilindia.in

BID DOCUMENT

Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project & 14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

Tender No:

SJI3301P20 Dated 06/12/2019

OIL INDIA LIMITED

(A Govt. of India Enterprise)
2A District Shopping Center, NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005
E-mail: bhavik_mody@oilindia.in

FORWARDING LETTER

Sub: Invitation of bids for Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

Dear Sirs,

Oil India Limited invites bids from prospective bidders for the subject item under "Single Stage Two Bid System" complete in all respect in accordance with the following details and enclosed Sections of the Bid Document:

1.0 BRIEF DETAILS:

Sl. No.	Description of Item	Particulars
i.	Supply, Installation and Commissioning of Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with is Comprehensive Operation & Maintenance for 25 years	At any suitable where land & connectivity with CTU/STU available in the state of Gujarat.
ii.	Period of commissioning	Complete Hybrid Project within eighteen (18) months from the date of issue of LOA
iii	Sale of Energy	Sale of energy will be to REMCL
iv.	Tender No. & Date	**SJI3301P20 dated 06.12.2019**
v.	Type / Mode of tendering	Domestic Open Tender under Single Stage Two Bid system through e-procurement portal**.**
vi.	Bid Document	The Bid Document comprises of Sections-I to X including this Forwarding Letter, all Annexure and Appendix.
vii.	Earnest Money Deposit (EMD) (Bid Security) and validity	**INR 2.75 Crore (Rupees Two Crore & Seventy Five lakh)** only to be submitted as per tender conditions. **Validity: 300 days** from Bid closing date.
viii.	Duration of Contract	a) EPC contract: Eighteen months from date of issue of LOA b) O&M contract- 25 years from date of stabilization/OAT of whole hybrid project

Sl. No.	Description of Item	Particulars
ix	Last Date & Time of loading of bid in OIL's e-Tender portal	As Mentioned in the On-line Tender
x.	Date & time of opening of un-priced bid	As Mentioned in the On-line Tender
xi.	Date & time of opening of Priced bid	Will be intimated to the qualified bidders nearer the time.
xii.	Venue for bid submission & opening of bids	2A District Shopping Center, NH62, Saraswati Nagar, Basni, Jodhpur- 342005, Rajasthan
xiii.	Technical Specification of Equipment	As given in Section IX & X
xiv.	Location of Project	At suitable potential site in the state of Gujarat.
xv.	Currency of Offer	Indian Rupees.
xvi.	Payment Terms	Payments shall be released against milestones as mentioned in Special Conditions of Contract.
xvii.	Payment for Operation & Maintenance of Hybrid Power Project	On quarterly basis of annual contract price after expiry of Guarantee / warrantee period on furnishing of Performance Bank Guarantee for contract performance for O&M
xiii.	Performance Security	As per Performance Security clause
xix.	Evaluation of Bids	Evaluation of Bids of eligible bidders shall be done as per details specified in the Bid Evaluation Methodology.
xx.	Validity of Offer	Offers shall be valid for a period of **270** days from original bid closing date.
xxi.	Quotation to be on 'Firm' price basis	Prices quoted as per price schedules P I-IV & P1-4 by the bidders shall remain 'Firm' during the bidder's Performance of the contract and not subject to variation on any account. Quotation submitted with variable price will be treated as non-responsive and the same shall be rejected.
xxii.	Custom Duty, CVD, etc.	For goods offered from abroad Custom Duty, CVD and other applicable levies, etc., if payable, will be paid directly by the bidder and shall be included in the tender price only.
xxiii	Liquidated Damages	As per tender conditions
xxiv	Project Consultant	M/s. Power And Energy Consultants India Limited (PEC), Delhi has been appointed as consultant for bid evaluation & site supervision works. Contact Person : Mr. C M Jain Mobile No. +91 9312262799 Contact Person : Mr. R. K. Mohta Mobile No. +91 9871282201

Sl. No.	Description of Item	Particulars
		e-mail: info@powerandenergyconsultants.com
xxv	Queries	Any queries regarding the tender may be forwarded in the prescribed format at Annexure-XIV to Oil India Limited and our Consultant PEC, Delhi Queries to be sent to : For OIL : i) Mr. Abhijit Dam, GM (Technical Services) OIL INDIA LIMITED 2A District Shopping Center, NH62, Saraswati Nagar, Jodhpur, Rajasthan 342005 Cell: +91 – 707309777 ii) Mr. S. K. Saikia, Senior Manager (BD-RE) OIL INDIA LIMITED 2A District Shopping Center, NH62, Saraswati Nagar, Jodhpur, Rajasthan 342005 Cell: +91 – 9971002012 E-mail: sksaikia@oilindia.in For PEC: i) Mr. C. M. Jain Mobile No. +91 9312262799 ii) Mr. R. K. Mohta Mobile No. +91 9871282201 e-mail: info@powerandenergyconsultants.com
xxvi	Bids to be addressed to	CGM (Services), M&C Department, Oil India Limited, 2A, Saraswati Nagar, Jodhpur-342005, Rajasthan, India

2.0 **Integrity Pact:** The Integrity Pact must be uploaded in OIL's E-procurement portal along with the Technical Bid digitally signed by the same signatory who signed the Bid i.e. who is duly authorized to sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit the Integrity Pact, their bid shall be rejected straightway. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who signs the Bid.

3.0 **GUIDELINES FOR PARTICIPATING IN OIL'S E-PROCUREMENT:**

3.1 To participate in OIL's E-procurement tender, bidders should have a legally valid digital certificate **of Class 3 with Organizations Name** and **Encryption certificate** as per Indian IT Act from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India (http://www.cca.gov.in). **Digital Signature Certificates having "Organization Name" field as "Personal" are not acceptable**.

3.2 Bidders without having E-tender Login ID and Password should complete their online registration at least seven (7) days prior to the scheduled bid closing date and time of the tender. For online registration, Bidder may visit the OIL's E-tender site https://etender.srm.oilindia.in/irj/portal

3.3 Necessary Login ID & Password will be issued by OIL only after submitting the complete online registration by the Bidder. In the event of late registration/incomplete registration by Bidder, OIL INDIA LIMITED shall not be responsible for late allotment of User ID & Password and request for bid closing date extension on that plea shall not be entertained by Company.

3.4 Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the NIT or submission of offers not substantially responsive to the bid in every respect will be at the bidders risk and may result in rejection of its offer without seeking any clarifications.

3.5 OIL INDIA LIMITED (OIL) has upgraded its E-tender Portal. As part of the new system, the intending bidder must have Encryption Certificate along with Digital Signature Certificate (DSC) of Class III [Organization]. The date for implementation of new system is 12th April 2017 and the requirement of the new DSC will be applicable for the tenders floated on 12th April 2017 onwards. All our current and prospective esteemed bidders are therefore requested to acquire Class III DSC [Organization] along with Encryption Certificate issued by any of the Licensed Certifying Authorities (CA) operating under Controller of Certifying Authorities (CCA) of India as per Indian IT Act 2000. Guideline for getting Digital Signature and other related information are available on the e-tender website www.oil-india.com. The bid signed using any other digital certificate or digital certificate without organization name of the bidder, will be liable for rejection.

3.6 Encryption certificate is mandatorily required for submission of bid. In case bidder created response using one certificate (using encryption key) and bidder subsequently changes the digital signature certificate then the old certificate (used for encryption) is required in order to decrypt his encrypted response for getting the edit mode of his response. Once decryption is done, the bidder may use his new DSC certificate for uploading and submission of his offer. It is the sole responsibility of the bidder to keep their DSC certificate properly. In case of loss of DSC certificate, Oil India Limited is not responsible.

3.7 MSEs Units (manufacturers/Service Providers only and not their dealers/distributors) who are already registered with District Industry Centres or Khadi & Village Industries Commission or Khadi & Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts & Handloom or any other body specified by Ministry of MSME are exempted from payment of Bid Security (EMD) irrespective of monetary limit mentioned in their registration, provided they are registered for the item they intend to quote/participate.

3.8 For availing benefits under Public Procurement Policy (Purchase preference & EMD exemption), the interested MSE Bidders must ensure that they are the manufacturer/ service provider of tendered item(s) and registered with the appropriate authority for the said item(s). Bids without EMD shall be rejected, if the technical offer does not include a valid copy of relevant MSE Certificate issued by appropriate authority specifying the item as per tender. Therefore, it is in the interest of such MSE Vendors to furnish a copy of complete certificate to the concerned tender handling officer of OIL at least seven (7) days prior to the scheduled Bid Closing Date of the tender; seeking clarification/confirmation as to whether their registered item is eligible for EMD exemption or not. Late communication in this regard and request for bid closing date extension on that plea shall not be entertained by Company.

3.9 Parties shall be eligible for accessing the tender in E-portal after OIL enables them in the E-portal on receipt of request for the same.

3.10 Parties, who do not have a User ID, can click on Guest login button in the OIL's E-portal to view the available open tenders. The detailed guidelines are available in OIL's e-procurement site (Help Documentation). For any clarification in this regard, Bidders may contact Mr. P. Barman, Manager (ERP-MM) at erp_mm@oilindia.in, Ph.: 03742804903/7192/7171/7178.

4.0 **QUERIES/CLARIFICATIONS ON THE TENDER:**

Interested bidders may contact the following person or the Project Consultant for any technical clarifications against the tender.

i) Mr. Abhijit Dam, GM (Technical Services)
OIL INDIA LIMITED
2A District Shopping Center, NH62,
Saraswati Nagar, Jodhpur, Rajasthan 342005
Cell: +91 – 707309777

ii) Mr. S. K. Saikia, Senior Manager (BD-RE)
OIL INDIA LIMITED
2A District Shopping Center, NH62,
Saraswati Nagar, Jodhpur, Rajasthan 342005
Cell: +91 – 9971002012.

5.0 **IMPORTANT NOTES:**

Bidders shall take note of the following important points while participating in OIL's e-procurement tender:

i) The bid along with all supporting documents must be submitted through OIL's E-procurement site only except the following documents which shall be submitted manually by the Bidder in two copies in a sealed envelope super-scribed with OIL's IFB No., Bid Closing date and marked as "Original Bid Security" and addressed to CGM (S), OIL INDIA LTD., Rajasthan Fields, 2A, Saraswati Nagar, Jodhpur-342005, Rajasthan (India):

a) Original Bid Security

b) Printed catalogue and Literature, if called for in the tender.

c) Power of Attorney for signing the bid.

d) Any other document required to be submitted in original as per tender requirement.

The above documents including the Original bid security, must be received at OIL's CGM (S)'s office at Jodhpur on or before 11.00 Hrs (IST) on the Bid Closing date failing which the bid shall be rejected. A scanned copy of the Bid Security shall also be uploaded by the Bidder along with their Technical Bid in OIL's E-procurement site.

ii) Bid should be submitted online in OIL's E-procurement site before 11.00 AM (IST) (Server Time) of the bid closing date as mentioned and will be opened on the same day at 3.00 PM (IST) at the office of the Materials & Contract Department in presence of the authorized representatives of the Bidders.

iii) If the digital signature used for signing is not of "Class -3" with Organizations name, the bid will be rejected.

iv) The tender is invited under SINGLE STAGE TWO BID SYSTEM. The bidders shall submit both the "TECHNICAL" and "PRICED" bids through electronic form in the OIL's e-Procurement portal within the Bid Closing Date and Time stipulated in the e-Tender. **Bidders to note that no price details should be uploaded in "Technical Attachments" Tab Page, otherwise the offer will be rejected. Details of prices as per Price Bid format/Priced bid to be uploaded under "Notes & Attachments" tab. Offer not complying with above submission procedure will be rejected.**

***The "Techno-Commercial Un-priced Bid" shall contain all techno commercial details except the prices.**

**** Please follow the instructions as per Vendor User Manual for Uploading Price under "Notes and Attachment" or "Condition"**

Note :

***** The "Technical Un-priced Bid" shall contain all techno-commercial details **except the prices**.

****** The "Price bid" must contain the price schedule and the bidder's commercial terms and conditions. For uploading Price Bid, first click on Sign Attachment, a browser window will open, select the file from the PC and click on "Sign" to sign the file. On Signing a new file with extension **.SIG** will be created. Close that window. Next click on Add Attachment, a browser window will open, select the **.SIG** signed file from the PC and name the file under Description, Assigned to General Data and click on OK to save the File.

Please refer "VENDOR USER MANUAL Rev2" document on OIL's e-tender portal for help on system settings and procedure to upload technical and price bids

(Bhavik Mody)
Manager (Materials & Contract)
For CGM-Services (RF)
For Executive Director (RF)
OIL INDIA LIMITED
2A District Shopping Center, NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

I N D E X

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SECTION–I

PROFILE OF OIL INDIA LIMITED

SECTION–I

PROFILE OF OIL INDIA LIMITED

The story of Oil India Limited (OIL) traces and symbolizes the development and growth of the Indian petroleum industry. From the discovery of crude oil in the far east of India at Digboi, Assam in 1889 to its present status as a fully integrated upstream petroleum company, OIL has come far, crossing many milestones.

On February 18, 1959, Oil India Private Limited was incorporated to expand and develop the newly discovered oil fields of Naharkatiya and Moran in the Indian North East. In 1961, it became a joint venture company between the Indian Government and Burmah Oil Company Limited, UK.

In 1981, OIL became a wholly-owned Government of India enterprise. Today, OIL is a premier Indian National Oil Company engaged in the business of exploration, development and production of crude oil and natural gas, transportation of crude oil and production of LPG. OIL also provides various E&P related services and holds 26% equity in Numaligarh Refinery Limited.

The Authorized share capital of the Company is INR 500 Crores. The Issued, Subscribed and Paid share capital of the company is INR 240.45 Crores. At present, The Government of India, the Promoter of the Company is holding 78.43% of the total Issued & Paid-up Capital of the Company. The balance 21.57% of the Equity capital is held by others.

OIL has over 1 lakh sq km of PEL/ML areas for its exploration and production activities, most of it in the Indian North East, which accounts for its entire crude oil production and majority of gas production. Rajasthan is the other producing area of OIL, contributing 10 per cent of its total gas production.

Additionally, OIL's exploration activities are spread over onshore areas of Ganga Valley and Mahanadi. OIL also has participating interest in NELP exploration blocks in Mahanadi Offshore, Mumbai Deepwater, Krishna Godavari Deepwater, etc. as well as various overseas projects in Libya, Gabon, Iran, Nigeria and Sudan.

In a recent CRISIL-India Today survey, OIL was adjudged as one of the five best major PSUs and one of three best energy sector PSUs in the country.

VISION

- Oil India is the fastest growing Energy Company with highest profitability
- The fastest growing energy company with a global presence providing value to the shareholder
- Oil India delights the customers with quality products and services at competitive prices.
- Oil India is a Learning Organization, nurturing initiatives, innovations and aspirations with best practices.

- Oil India is a team, committed to honesty, integrity, transparency and mutual trust creating employee pride.
- Oil India is fully committed to safety, health and environment.
- Oil India is a responsible corporate citizen deeply committed to socio-economic development in its areas of operations.
- Strategic Plan 2011-20 for diversification into Renewable & Alternate Energy domain.
- As part of its green energy initiative, Oil India Limited is pursuing to generate power from the renewable sources of energy available in the country.

COMMISSIONED PROJECTS

- A 13.6 MW Wind Energy Power Project (WEPP) at Ludurva, Jaisalmer, Rajasthan. This project which was commissioned on 31.03.2012
- A 54 MW Wind Energy Power Project at Dangri, Jaisalmer, Rajasthan. This project which was commissioned on 30.03.2013
- A 100 KW Solar PV Power Plant (Grid interactive) at Joypur Oil Collecting Station & Joypur Gas Compressor Station Complex at its Field Headquarters at Assam. This project was commissioned on 31.03.2012.
- A 30 KW roof top Solar PV Power Plant (Grid connected) at its Corporate Office, Noida. This project was commissioned on 16.07.2012.
- A 100 KW Solar PV Power Plant (Grid connected) at Tanot Village complex, Tanot, Rajasthan within it's operational in Rajasthan. This project was commissioned on 15.03.2013.
- A 5 MW Solar PV Power Plant (Grid Connected) at Ramgarh, Jaisalmer, Rajasthan. This project which was commissioned on 23.01.2014
- A 9 MW Solar PV Power Plant (Grid Connected) at Ramgarh, Jaisalmer, Rajasthan. This project which was commissioned on 25.02.2016
- A 54 MW Wind Energy Power Project split between Madhya Pradesh (38 MW at Chandgarh) and Gujarat (16 MW at Patan), Project was commissioned on 31.03.2015.
- 52.5 MW Wind Energy Power Project split between Madhya Pradesh (25.2 MW at Unchwas) and Gujarat (27.3MW at Kotiya Veer) commissioned on 31.03.2018 and 12.01.2018 respectively.
- 500 KW Ground mounted Solar PV power Plant at Ps#3 Jorhat, Assam, Project was commissioned on 19.03.2018

It is worthy to mention note that the diversification initiatives taken by OIL into the Renewable Energy domain, has provided both tangible and intangible benefits to the Company, helping it to enhance its brand image both as a producer of Green Energy and a Responsible Corporate

SECTION–II

INSTRUCTIONS TO BIDDERS

SECTION–II
INSTRUCTIONS TO BIDDERS (ITB)

2.1 GENERAL

Oil (India) Limited invites tender under Single Stage-Two Bid System. The bidders are required to submit both the “techno-commercial un-priced” and “priced” bids through electronic format. The Bidder can quote solely or in consortium their prices for each portion in Price Schedules in the following manner:

2.2 BID DOCUMENTS

The services required, bidding procedures and contract terms are prescribed in the Bid Document. This Bid Document includes the following:

a) Forwarding Letter highlighting the following points:

(i) Company’s IFB No. & Type
(ii) Bid closing date and time
(iii) Bid opening date and time
(iv) Bid submission Mode
(v) Bid opening place
(vi) Bid validity, Mobilization time & Duration of contract
(vii) The amount of Bid Security with validity
(viii) The amount of Performance Guarantee with validity
(ix) Liquidated damages

b) Profile of OIL India
c) Instructions to Bidders, (Section II)
d) Bid Evaluation Criteria, (Section III)
e) General Conditions of Contract, (SECTION-IV)
f) Special Conditions of Contract for Supply, Erection & Commissioning, (SECTION-V)
g) Special Conditions of Contract for Operation & Maintenance, (SECTION-VI)
h) Scope of Work, Wind (SECTION-VII)
i) Scope of Work, Solar (SECTION-VIII)
j) Technical Specification, Wind (SECTION – IX)
k) Technical Specification, Solar (SECTION – X)
l) Form & Formats – (SECTION-XI)
m) Price Schedules PI-PIV and P1 – P4
n) Annexures – I - XIII

The bidder is expected to examine all instructions, forms, terms and specifications in the Bid Documents. Failure to furnish all information required in the Bid Documents or submission of a bid not substantially responsive to the Bid Documents in every respect will be at the Bidder's risk & responsibility and may result in the rejection of its bid.

2.3 TRANSFERABILITY OF BID DOCUMENTS:

2.3.1 Bid Documents are non-transferable. Bid can be submitted only in the name of the bidder in whose name the Bid Document has been issued.

2.3.2 Unsolicited bids will not be considered and will be rejected straightway.

2.4 AMENDMENT OF BID DOCUMENTS:

2.4.1 At any time prior to the deadline for submission of bids, the Company may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bid Documents through issuance of an Addendum.

2.4.2 The Addendum will be uploaded in OIL's E-Tender Portal in the "Technical RFx Response" under the tab "Amendments to Tender Documents". The Company may, at its discretion, extend the deadline for bid submission, if the Bidders are expected to require additional time in which to take the Addendum into account in preparation of their bid or for any other reason. Bidders are to check from time to time the E-Tender portal ["Technical RFx Response" under the tab "Amendments to Tender Documents"] for any amendments to the bid documents before submission of their bids. No separate intimation shall be sent to the Bidders.

2.5 **PREPARATION OF BIDS**

2.5.1 LANGUAGE OF BIDS: The bid as well as all correspondence and documents relating to the bid exchanged between the Bidder and the Company shall be in English language, except that any printed literature may be in another language provided it is accompanied by an official and notarised English translated version, which shall govern for the purpose of bid interpretation.

2.5.2 BIDDER'S/AGENT'S NAME & ADDRESS: Bidders should indicate in their bids their detailed postal address including the Fax/Telephone /Cell Phone Nos. and E-mail address. Similar information should also be provided in respect of their authorised Agents in India, if any

2.6 **DOCUMENTS COMPRISING THE BID:**

2.6.1 Bids are invited under Single Stage Two Bid System. The bid to be uploaded by the Bidder in OIL's E-Tender portal shall comprise of the following components:

2.7 **TECHNICAL BID**

(i) Complete technical details of the services offered.
(ii) Documentary evidence established in accordance with BEC (SECTION-III).
(iii) Bid Security (scanned) in accordance with Clause 2.11 hereunder. Original Bid Security should be sent as per Clause No. 2.11.2 below.
(iv) Copy of Bid-Form without indicating prices in ANNEXURE-I.
(v) Statement of Compliance as per ANNEXURE-XV.
(vi) Copy of Priced Bid without indicating prices (Bid Response Sheets PI-PIV, P1-P3, Schedule of Price 3A)
(viii) Integrity Pact digitally signed by OIL's competent personnel as Annexure-XII, attached with the bid document to be digitally signed by the bidder.
(ix) Undertaking as per Annexure-XIV.

2.8 **PRICED BID**

Bidder shall quote their prices in the following Annexures/Bid Response sheets available in OIL's E-procurement portal in the "Notes & Attachments" Tab:

(i) Price-Bid Format as per prices (Bid Response Sheets PI-PIV, P1-P3, Schedule of Price 3A)
(ii) Bid Form as per ANNEXURE-I
The Priced Bid shall contain the prices along with the currency quoted and any other commercial information pertaining to the service offered.

2.8.1 BID FORM: The bidder shall complete the Bid Form and the appropriate Price Schedule furnished in their Bid.

2.8.2 BID PRICE: Prices must be quoted by the Bidders online as per the price bid format available in OIL's E- Tender Portal in "Notes & Attachment" Tab. Unit prices must be quoted by the bidders, both in words and in figures.

2.8.3 Prices quoted by the successful bidder must remain firm during its performance of the Contract and is not subject to variation on any account.

2.8.4 All duties and taxes including Corporate Income Tax, Personal Tax, Octroi / Entry Tax etc. (excluding GST) and other Cess / levies payable by the successful bidder under the Contract for which this Bid Document is being issued, shall be included in the rates, prices and total Bid Price submitted by the bidder, and the evaluation and comparison of bids shall be made accordingly. For example, personal taxes and/or any corporate taxes arising out of the profits on the contract as per rules of the country shall be borne by the bidder.

2.9 **CURRENCIES OF BID AND PAYMENT:**

As this is a tender involving only Indian bidders (Local Competitive Bidding) the currency of the bid must be in Indian Rupees only and payment will be made accordingly in Indian Rupees.

2.10 **DOCUMENTS ESTABLISHING BIDDER'S ELIGIBILITY AND QUALIFICATIONS:**

These are listed in BID EVALUATION CRITERIA (BEC), SECTION-III of the Bid document.

2.11 **BID SECURITY:**

2.11.1 The Bid Security is required to protect the Company against the risk of Bidder's conduct, which would warrant forfeiture of the Bid Security, pursuant to sub-clause 2.11.9 hereunder.

2.11.2 All the bids must be accompanied by Bid Security in Original for the amount as mentioned in the "Forwarding Letter" or an equivalent amount in other freely convertible currency and shall be in the OIL's prescribed format as Bank Guarantee (BG) enclosed with the NIT vide **ANNEXURE-II** in favour of OIL and payable at Jodhpur, Rajasthan or an irrevocable Letter of Credit (L/C) from any of the following Banks –

a) Any schedule Indian Bank or Any Branch of an International bank situated in India and registered with Reserve Bank of India as scheduled foreign bank in case of domestic Bidder, or

b) The Bank Guarantee / LC shall be valid for the time as asked for in the Bid Document. Bank Guarantees issued by Banks in India should be on non-judicial stamp paper of requisite value, as per Indian Stamp Act, purchased in the name of the Banker.

Note: Bid Security in the form of DD/Cheque/Cashier Cheque or any other mode will not be acceptable.

The following is the Bank details of OIL, Rajasthan Project for obtaining Bank Guarantee:

Bank Details of Beneficiary(OIL, Rajasthan Project)	
a) Bank Name	CORPORATION BANK
b) Branch Name	JODHPUR BRANCH (0492)
c) Branch Address	No. 76, LK TOWER, CHOPASANI ROAD, JODHPUR-342003, RAJASTHAN
d) Banker Account No.	049200201000626
e) Type of Account	CURRENT ACCOUNT
f) IFSC Code	CORP0000492
g) MICR Code	342017002
h) SWIFT Code	N/A
i) Contact No.	0291-2649128, 2625504
j) Contact Person Name	MR. P. RAMNATH DIWAKAR
k) Fax No.	-
l) Email Id	cb492@corpbank.co.in

2.11.3 Bidders can also submit Bid Security on-line through OIL's electronic Payment Gateway in the e-tender portal. In case the bidder chooses to submit online EMD the bidder has to submit EMD valuing total amount of INR 2,75,00,000.00 only irrespective of whether the bidder is submitting bid for one part of the tender or the full tender.

2.11.4 The Bank Guarantee shall be valid for 300 days beyond the Bid closing date.

2.11.5 Bank Guarantee with any condition other than those mentioned in OIL's prescribed format shall not be accepted and bids submitted by bidders with such Bank Guarantee will be liable for rejection.

2.11.6 The Bank Guarantee issued by a Bank amongst others shall contain the complete address of the Bank including Phone Nos., Fax Nos., E□mail address and Branch Code.

2.11.7 Bid Security shall not accrue any interest during its period of validity or extended validity. OIL shall not be liable to pay any bank charges, commission or interest on the amount of Bid Security.

2.11.8 The Bank Guarantee should be enforceable at all branches of the issuing Bank within India and preferably at Jodhpur, Rajasthan, the place of issuance of tender.

2.11.9 Any bid not secured in accordance with sub-clause 2.11.2 above shall be rejected by the Company as non-responsive. Bank Guarantee issued by a Scheduled Bank in India at the request of some other Non-Scheduled Bank of India shall not be acceptable.

2.11.10 The Bidders shall extend the validity of the Bid Security suitably, if and when specifically advised by OIL, at the Bidder's cost.

2.11.11 Unsuccessful Bidder's Bid Security will be discharged and/or returned within 30 days after finalization of IFB.

2.11.12 Successful Bidder's Bid Security will be discharged and/or returned upon Bidder's furnishing the Performance Security and signing of the contract. Successful Bidder will however ensure validity of the Bid Security till such time the Performance Security in conformity with Clause 2.29 below is furnished.

2.11.13 The Bid Security may be forfeited, if:

i) The Bidder withdraws the bid within its original/extended validity.
ii) The Bidder modifies/revise their bid suo-moto.
iii) Bidder does not accept the order/contract.
iv) Bidder does not furnish Performance Security Deposit within the stipulated time as per tender/order/contract.
v) If it is established that the Bidder has submitted fraudulent documents or has indulged into corrupt and fraudulent practice, the bid security shall be forfeited after due process in addition to other action against the Bidder

2.11.14 In case any Bidder withdraws their bid during the period of bid validity, Bid Security will be forfeited and the party shall be put in the Holiday List for a period varying from six (06) months to two (02) years as the case may be as per Company's Banning Policy (available in OIL website).

2.11.15 **The scanned copy of the original Bid Security in the form of either Bank Guarantee or LC must be uploaded by Bidder along with the Technical bid in the "Technical Attachment" of OIL's E-portal**. The original Bid Security shall be submitted by Bidder to the office of DGM (M&C), Oil India Ltd., Rajasthan Project, 2A-Saraswati Nagar, Jodhpur-342005, Rajasthan, India in a sealed envelope which must reach the office on or before 11.00 Hrs (IST) of the Bid Closing date. The envelope must be super-scribed with "Bid Security", IFB No., Description & Bid Closing Date.

2.11.16 A bid shall be rejected straightway if Original Bid Security is not received within the stipulated date & time mentioned in the Tender and/or if the Bid Security validity is shorter than the validity indicated in Tender and/or if the Bid Security amount is lesser than the amount indicated in the Tender.

2.11.17 Bidders are requested to advise the Bank Guarantee issuing bank to comply with the following and ensure to submit, the receipt of the copy of SFMS message as sent by the issuing bank branch, along with the original Bank Guarantee in OIL's tender issuing office / upload the same in OIL's e-tender portal along with the technical bid.

The bank guarantee issued by the bank must be routed through SFMS platform as per following details:

(a) "MT 760 / MT 760 COV for issuance of bank guarantee
(b) "MT 760 / MT 767 COV for amendment of bank guarantee

The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Jodhpur Branch, IFS Code - UTIB0000057; Swift Code: AXISINBB057. Branch Address - AXIS Bank Ltd, Prince Tower, Near Jaljog Circle, Residency Road, Jodhpur - 342003"

2.12 **EXEMPTION FROM SUBMISSION OF BID SECURITY:**

2.12.1 Central Govt. offices and Central Public Sector undertakings are exempted from submitting Bid Security.

2.12.2 If the Bidder is a Micro or Small Enterprises (MSE) registered with District Industry Centres or Khadi and Village Industries Commission or Khadi and Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts and Handloom or any other body specified by Ministry of MSME, then they are also exempted from submitting Bid Security. Bidding MSEs shall have to submit a Copy of valid Registration Certificate clearly indicating the monetary limit, if any and the items for which Bidder are registered with any of the aforesaid agencies.

In case bidding MSE is owned by Schedule Caste or Schedule Tribe entrepreneur, valid documentary evidence issued by the agency who has registered the Bidder as MSE owned by SC/ST entrepreneur should also be enclosed.

2.13 **PERIOD OF VALIDITY OF BIDS**:

2.13.1 Bids shall remain **valid for 270** days from the date of closing of bid prescribed by the Company. **Bids of shorter validity will be rejected as being non-responsive.** If nothing is mentioned by the bidder in their bid about the bid validity, it will be presumed that the bid is valid for 270 days from Bid Closing Date.

2.13.2 In exceptional circumstances, the Company may solicit the Bidder's consent to an extension of the period of validity. The request and the response thereto shall be made in writing through Fax or e-mail. The Bid Security provided under Para 11.0 above shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request will neither be required nor permitted to modify their Bid.

2.14 **SIGNING OF BID:**

2.14.1 Bids are to be submitted online through OIL's E-procurement portal with digital signature. The bid and all attached documents should be digitally signed by the bidder using "Class 3" digital certificates with Organizations Name [e-commerce application (Certificate with personal verification and Organisation Name)] as per Indian IT Act 2000 obtained from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India before bid is uploaded. Digital Signature Certificates having "Organization Name" field other than Bidder's Name are not acceptable. However, aforesaid Digital Signature Certificates having Bidder's Name in the "Organization Name" field are acceptable.

The bid including all uploaded documents shall be digitally signed by duly authorized representative of the bidder holding a Power of Attorney to bind the Bidder to the contract.

If any modifications are made to a document after attaching digital signature, the digital signature shall again be attached to such documents before uploading the same. The Power of Attorney shall be submitted by bidder as mentioned in Para 2.15.1 below.

The authenticity of above digital signature shall be verified through authorized CA after bid opening and in case the digital signature is not of "Class-3" with organization name, the bid will be rejected.

Bidder is responsible for ensuring the validity of digital signature and its proper usage by their employees.

2.14.2 The original and all copies of the bid shall be typed or written in indelible inks. Since bids are to be submitted ONLINE with digital signature, manual signature is NOT relevant. The letter of authorisation (as per **ANNEXURE-XVI**) shall be indicated by written Power of Attorney accompanying the Bid.

2.14.3 Any person signing the Bid or any other document in respect of this Bidding Document or other relevant documents on behalf of the Bidder without disclosing his authority to do so shall be deemed to have the authority to bind the Bidder. If it is discovered at any time that the person so signing has no authority to do so, the Company (OIL) may, without prejudice to any other right or remedy, cancel his Bid or Contract and hold the Bidder liable to the Company (OIL) for all costs and damages arising from the cancellation of the Bid or Contract including any loss which the Company (OIL) may sustain on account thereof.

2.14.4 Any physical documents submitted by bidders shall contain no interlineations, white fluid erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such correction shall be initialled by the person or persons who has/have digitally signed the Bid.

2.14.5 Any Bid, which is incomplete, ambiguous, or not in compliance with the Bidding process will be rejected.

2.15 SUBMISSION OF BIDS

2.15.1 The tender is processed under single stage - Two bid system. Bidder shall submit the Technical bid and Priced bid along with all the Annexure and Proforma (wherever applicable) and copies of documents in electronic form through OIL's e-procurement portal within the Bid Closing Date & Time stipulated in the e-tender. For submission of Bids online at OIL's E-Tender Portal, detailed instructions are available in **"HELP DOCUMENTATION"** available in OIL's E-Tender Portal. Guidelines for bid submission are also provided in the "Forwarding Letter". The Technical Bid is to be submitted as per Terms of Reference/Technical Specifications of the bid document and Priced Bid as per the Price Schedule. The Technical Bid should be uploaded in the "Technical RFx Response" under "Techno-Commercial Bid" Tab Page only. Prices to be quoted as per "Price Bid Format" and to be uploaded as Attachment under "Notes and Attachments" Tab under General Data in the e-portal. **No price should be given in the "Technical RFx Response", otherwise bid shall be rejected.** The priced bid should not be submitted in physical form and which shall not be considered.

However, the following documents in one set should necessarily be submitted in physical form in sealed envelope super scribing the "IFB No., Brief Description of services and Bid Closing/Opening date & Time along with the bidder's name" and should be submitted to Chief General Manager (M&C), Oil India Ltd., Rajasthan Fields, 2A-Saraswati Nagar, Jodhpur-342005, Rajasthan, India on or before 11.00 Hrs (IST) on the bid closing date indicated in the IFB :

i) The Original Bid Security along with 1(one) copy
ii) Power of Attorney for signing of the bid digitally
iii) Any other document required to be submitted in original as per bid document requirement.
iv) Printed catalogue and literature if called for in the bid document.

Documents sent through E-mail/Fax/Telephonic method will not be considered.

2.15.2 All the conditions of the order to be awarded to the successful bidder are given in various Sections of the Bid Document. Bidders are requested to state their compliance to each clause as per **ANNEXURE-XV** of the bid document and in case of non-compliance, if any, the same to be highlighted in the **ANNEXURE-XV** and the same should be uploaded along with the Technical Bid.

2.15.3 Timely delivery of the documents in physical form as stated in Para 2.15.1 above is the responsibility of the bidder. Bidders should send the same through Registered Post or by Courier Services or by hand delivery to the Officer in Charge of the particular tender before the Bid Closing Date and Time. Company shall not be responsible for any postal delay/transit loss.

2.15.4 Bids received through the e-procurement portal shall only be accepted. Bids received in any other form shall not be accepted.

2.15.5 Bidder has to categorically sign and upload the Undertaking as per **Annexure-XIV** attached along with the techno-commercial bid in e-tender portal.

2.16 **INDIAN AGENT/REPRESENTATIVE/RETAINER/ASSOCIATE**: *Not Applicable for this tender.*

2.17 **DEADLINE FOR SUBMISSION OF BIDS:** Bids should be submitted online as per the online tender submission deadline. Bidders will not be permitted by System to make any changes in their bid/quote after the bid submission deadline is reached.

2.17.1 No bid can be submitted after the submission dead line is reached. The system time displayed on the e-procurement web page shall decide the submission dead line.

2.17.2 The documents in physical form as stated in Para 2.15.1 must be received by Company at the address specified in the "Forwarding Letter" on or before 11.00 Hrs (IST) on the Bid Closing Date mentioned in the "Forwarding Letter". Timely delivery of the same at the address mentioned in the Forwarding Letter is the responsibility of the Bidders.

2.18 **LATE BIDS:** Bidders are advised in their own interest to ensure that their bids are uploaded in system before the closing date and time of the bid. The documents in physical form mainly the Original Bid Security if received by the Company after the deadline for submission prescribed by the Company shall be rejected and shall be returned to the Bidders in unopened condition immediately.

2.19 **MODIFICATION AND WITHDRAWAL OF BIDS:**

2.19.1 The Bidder after submission of Bid may modify or withdraw its Bid prior to Bid Closing Date & Time.

2.19.2 No Bid can be modified or withdrawn subsequent to the deadline for submission of Bids.

2.19.3 No Bid can be withdrawn in the interval between the deadline for submission of Bids and the expiry of the period of Bid Validity specified by the Bidder on the Bid Form. Withdrawal of a Bid during this interval shall result in the Bidder's forfeiture of its Bid Security and bidder shall also be debarred for a period of two(02) years from participation in future tenders of OIL.

2.20 **EXTENSION OF BID SUBMISSION DATE:**
Normally no request for extension of Bid Closing Date & Time will be entertained. However, OIL at its discretion, may extend the Bid Closing Date and/or Time due to any reasons.

2.21 **BID OPENING AND EVALUATION:**

2.21.1 Company will open the Technical Bids, including submission made pursuant to clause 2.19, in presence of Bidder's representatives who choose to attend at the date, time and place mentioned in the Forwarding Letter. However, an authorisation letter (as per **ANNEXURE-XVII**) from the Bidder must be produced by the Bidder's representative at the time of Bid Opening. Unless this Letter is presented, the representative will not be allowed to attend the Bid Opening. The Bidder's representatives who are allowed to attend the Bid Opening shall sign a register evidencing their attendance. Only one representative against each Bid will be allowed to attend. In technical bid opening, only “Technical RFx Response” will be opened. Bidders therefore should ensure that technical bid is uploaded in the “Technical RFx Response” Tab Page only in the E-portal.

2.21.2 In case of any unscheduled holiday or Bandh on the Bid Opening Date, the Bids will be opened on the next full working day. Accordingly, Bid Closing Date / time will get extended up to the next working day and time.

2.21.3 Bids which have been withdrawn pursuant to clause 2.19 shall not be opened. Company will examine bids to determine whether they are complete, whether requisite Bid Securities have been furnished, whether documents have been digitally signed and whether the bids are generally in order.

2.21.4 At bid opening, Company will announce the Bidder's names, written notifications of bid modifications or withdrawal, if any, the presence of requisite Bid Security and such other details as the Company may consider appropriate.

2.21.5 Normally no clarifications shall be sought from the Bidders. However, for assisting in the evaluation of the bids especially on the issues where the Bidder confirms compliance in the evaluation and contradiction exists on the same issues due to lack of required supporting documents in the Bid (i.e. document is deficient or missing), or due to some statement at other place of the Bid (i.e. reconfirmation of confirmation) or vice versa, clarifications may be sought by OIL. In all the above situations, the Bidder will not be allowed to change the basic structure of the Bid already submitted by them and no change in the price or substance of the Bid shall be sought, offered or permitted.

2.21.6 Prior to the detailed evaluation, Company will determine the substantial responsiveness of each bid to the requirement of the Bid Documents. For purpose of these paragraphs, a substantially responsive bid is one, which conforms to all the terms and conditions of the Bid Document without material deviations or reservation. A material deviation or reservation is one which affects in any way substantial way the scope, quality, or performance of work, or which limits in any substantial way, in-consistent way with the Bid Documents, the Company's right or the bidder's obligations under the contract, and the rectification of which deviation or reservation would affect unfairly the competitive position of other bidders presenting substantial responsive bids. The Company's determination of Bid's responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.

2.21.7 A Bid determined as not substantially responsive will be rejected by the Company and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

2.21.8 The Company may waive minor informality or nonconformity or irregularity in a Bid, which does not constitute a material deviation, provided such waiver, does not prejudice or affect the relative ranking of any Bidder.

2.22 **OPENING OF PRICED BIDS:**

2.22.1 Company will open the Priced Bids of the technically qualified Bidders on a specific date in presence of representatives of the qualified bidders. The technically qualified Bidders will be intimated about the Priced Bid Opening Date & Time in advance. In case of any unscheduled holiday or Bandh on the Priced Bid Opening Date, the Bids will be opened on the next working day.

2.22.2 The Company will examine the Price quoted by Bidders to determine whether they are complete, any computational errors have been made, the documents have been properly signed, and the bids are generally in order.

2.22.3 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price (that is obtained by multiplying the unit price and quantity) the unit price shall prevail and the total price shall be corrected accordingly. If there is a discrepancy between words, and figures, the amount in words will prevail. If any Bidder does not accept the correction of the errors, their Bid will be rejected.

2.22.4 For convenience of the qualified Bidders and to improve transparency, the rates/costs quoted by bidders against OIL's e-tenders shall be available for online viewing by such Bidders whose price bids are opened by Company. A Bidder can view item-wise rates/ costs of all other such peer bidders against the tender immediately after price bid opening, if the e-tender is floated by Company with PRICE CONDITION. In case the Price-Bid is invited by Company through attachment form under "Notes & Attachment" (i.e., NO PRICE Condition), Bidders must upload their detailed Price-Bid as per the prescribed format under "Notes & At4ichment", in addition to filling up the "Total Bid Value" Tab taking into account the cost of all individual line items and other applicable charges like freight, tax, duties, levies etc. Under NO PRICE Condition (i.e., Price Bid in attachment form), the "Total Bid Value" as calculated & quoted by the Bidder shall only be shared amongst the eligible bidders and Company will not assume any responsibility whatsoever towards calculation errors/ omissions therein, if any. Notwithstanding to sharing the "Total Bid Value" or the same is whether filled up by the Bidder or not,

Company will evaluate the cost details to ascertain the inter-se-ranking of bidders strictly as per the uploaded attachment and Bid Evaluation Criteria only. Online view of prices as above shall be available to the Bidders only upto seven days from the date of Price-Bid opening of the-tender.

2.23 **CONVERSION TO SINGLE CURRENCY**: *Not Applicable for this tender.*

2.24 **EVALUATION AND COMPARISON OF BIDS:**
The Company will evaluate and compare the bids as per BID EVALUATION METHODOLOGY in SECTION-III of the Bid Document.

2.24.1 DISCOUNTS / REBATES: Unconditional discounts/rebates, if any, given in the bid will be considered for evaluation.

2.24.2 Post bid or conditional discounts/rebates offered by any bidder shall not be considered for evaluation of bids. However, if the lowest bidder happens to be the final acceptable bidder for award of contract, and if they have offered any discounts/rebates, the contract shall be awarded after taking into account such discounts/rebates.

2.25 **CONTACTING THE COMPANY:**

2.25.1 Except as otherwise provided in Clause 2.21 above, no Bidder shall contact Company on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded except as required by Company vide sub-clause 2.21.6.

2.25.2 An effort by a Bidder to influence the Company in the Company's bid evaluation, bid comparison or Contract award decisions may result in the rejection of their bid.

2.26 **AWARD CRITERIA**:
The Company will award the Contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined as the lowest evaluated bid, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

2.27 **COMPANY'S RIGHT TO ACCEPT OR REJECT ANY BID**:
Company reserves the right to accept or reject any or all bids and to annul the bidding process and reject all bids, at any time prior to award of contract, without thereby incurring any liability to the affected bidder, or bidders or any obligation to inform the affected bidder of the grounds for Company's action.

2.28 **NOTIFICATION OF AWARD:**

2.28.1 Prior to the expiry of the period of bid validity or extended validity, Company will notify the successful Bidder in writing by registered letter or by fax or E-mail (to be confirmed in writing by registered / couriered letter) that its Bid has been accepted.

2.28.2 The notification of award will constitute the formation of the Contract.

2.28.3 Upon the successful Bidder's furnishing of Performance Security pursuant to Clause 2.29 below, the Company will promptly notify each un-successful Bidder and will discharge their Bid Security, pursuant to Clause 2.11 herein above.

2.29 **PERFORMANCE SECURITY**:

2.29.1 On receipt of notification of award from the Company, the successful Bidder shall furnish to Company the Performance Security for an amount specified in the Forwarding Letter (and Letter of Award (LOA) issued by Company to Contractor awarding the contract) as per ANNEXURE-III or in any other format acceptable to the Company and must be in the form of a Bank Guarantee or irrevocable Letter of Credit (LC) from any schedule Indian Bank registered with Reserve Bank of India.

Bank Guarantee issued by a Bank, amongst others, must contain the following particulars of such bank:
a) Full address.
b) Branch Code.
c) Code Nos. of the authorized signatory with full name and designation.
d) Phone Nos., Fax Nos., E-mail address.

The domestic Bidders will have to submit the Bank Guarantee from any of the scheduled banks and on non-judicial stamp paper of requisite value as per the Indian Stamp Act, purchased in the name of the issuing banker.

The Performance Security shall be denominated in INR.

2.29.2 The Performance Security specified above must be valid as under:

i) 10% of design, supply, installation, commissioning, start-up value (but excluding O&M value) of the Purchase order valid for atleast 48 months from the issuance of LOA.
ii) 10% of total O&M value for 25 years valid for first 5 years.
iii) 7.5% of total O&M value for 20 years valid for subsequent 5 years.
iv) 5% of remaining O&M value valid for rest of O&M period.

2.29.3 The Performance Security will be discharged by Company not later than 30 days following its expiry. In the event of any extension of the Contract period, Bank Guarantee should be extended by Contractor by the period equivalent to the extended period.

2.29.4 The Performance Security shall be payable to Company as compensation for any loss resulting from Contractor's failure to fulfil its obligations under the Contract.

2.29.5 The Performance Security will not accrue any interest during its period of validity or extended validity.

2.29.6 Failure of the successful Bidder to comply with the requirements of clause 2.29 and/or 2.30 shall constitute sufficient grounds for annulment of the award and forfeiture of the Bid Security or Performance Security. In such an eventuality, the party shall be put in the Holiday List for a period from six (06) months to two (02) years as the case may be as per Company's Banning Policy.

2.29.7 Bidders are requested to advise the Bank Guarantee issuing bank to comply with the following and ensure to submit, the receipt of the copy of SFMS message as sent by the issuing bank branch, along with the original Bank Guarantee in OIL's office.
The bank guarantee issued by the bank must be routed through SFMS platform as per following details:

(a) "MT 760 / MT 760 COV for issuance of bank guarantee
(b) "MT 760 / MT 767 COV for amendment of bank guarantee

The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Jodhpur Branch, IFS Code - UTIB0000057; Swift Code: AXISINBB057. Branch Address - AXIS Bank Ltd, Prince Tower, Near Jaljog Circle, Residency Road, Jodhpur - 342003"

2.30 **SIGNING OF CONTRACT:**

2.30.1 At the same time as the Company notifies the successful Bidder that its Bid has been accepted, the Company will either call the successful Bidder for signing of the agreement or send the Contract Form provided in the Bid Documents, along with the General & Special Conditions of Contract, Technical Specifications, Schedule of Rates incorporating all agreements agreed between the two parties.

2.30.2 The successful Bidder shall sign and date the contract and return it to the Company after receipt of LOA. Till the contract is signed, the LOA issued to the successful bidder shall remain binding amongst the two parties.

2.30.3 In the event of failure on the part of the successful Bidder to sign the contract, OIL reserves the right to terminate the LOA issued to the successful Bidder and invoke the Bid Security or the Performance Security if submitted by the successful Bidder. The party shall also be debarred for a period of 2(two) years from the date of default.

2.31 **FURNISHING FRAUDULENT INFORMATION/DOCUMENTS**:

If it is found that a bidder/contractor has furnished fraudulent information / documents, the Bid Security/Performance Security shall be forfeited and the party shall be debarred for a period of 3 (three) years from the date of detection of such fraudulent act besides the legal action.

2.32 **INTEGRITY PACT:**

2.32.1 OIL shall be entering into an Integrity Pact with the Bidders as per format enclosed vide Annexure-A1of the Bid Document. The Integrity Pact has been duly signed digitally by OIL's competent signatory and uploaded in the OIL's e-portal. The Integrity Pact shall be uploaded by the Bidder (along with the technical Bid) duly signed by the same signatory who signed the Bid i.e. who is duly authorized to sign the Bid. Uploading the Integrity Pact in the OIL's E-portal with digital signature will be construed that all pages of the Integrity Pact has been signed by the Bidder's authorized signatory who has signed the bid. If any Bidder refuses to sign Integrity Pact or declines to submit the Integrity Pact, their bid shall be rejected straightway.

2.32.2 OIL's Independent External Monitors(IEM) to oversee implementation of Integrity Pact in OIL are:

1. SHRI RAJIV MATHUR, IPS (Retd.),
   E-mail : rajivmathur23@gmail.com
2. SHRI JAGMOHAN GARG, Ex-Vigilance Commissioner, CVC
   E-Mail id : jagmohan.garg@gmail.com
3. Shri Rudhra Gangadharan, IAS (Retd.)
   Ex-Secretary, Ministry of Agriculture
   E-mail: rudhra.gangadharan@gmail.com

2.33 **SITE CONDITIONS**

2.33.1 Bidder shall satisfy himself of the site conditions and shall apprise himself of the procedure for engagement of agencies / labour and shall collect other relevant

information that may be required before submitting the bid. Claims and objections due to ignorance of site condition will not be considered after submission of the bid.

2.33.2 Bidder shall fully acquaint himself as to all conditions and matters, which may in any way affect the work or the cost thereof. The bidder shall be deemed to have himself independently obtained all necessary information for the purpose of preparing the bid and his bid as accepted shall be deemed to have taken into account all contingencies as may arise due to such information or lack of the same.

2.33.3 Bidder shall be deemed to have visited and carefully examined the site and surroundings to have satisfied himself about the nature of all existing facilities, infrastructure available for transport and communications and access to the site for developing the hybrid power project.

2.33.4 Bidder is deemed to have acquainted himself of Government taxes, laws structure, regulations, levies and other charges relating to the tendered work at site.

2.33.5 Bidder shall obtain all the necessary clearances / permission / NOCs etc. for development of the site for hybrid power project.

2.34 Any neglect or omission or failure on the part of the bidder in obtaining necessary clearances 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.

2.35 **LOCAL CONDITIONS:**

It is imperative for each Bidder to be fully informed themselves of all Indian as well as local conditions, factors and legislation which may have any effect on the execution of the work covered under the Bidding Document. The bidders shall be deemed, prior to submitting their bids to have satisfied themselves of all the aspects covering the nature of the work as stipulated in the Bidding Document and obtain for themselves all necessary information as to the risks, contingencies and all other circumstances, which may influence or affect the various obligations under the Contract.

No request will be considered for clarifications from the Company (OIL) regarding such conditions, factors and legislation. It is understood and agreed that such conditions, factors and legislation have been properly investigated and considered by the Bidders while submitting the Bids. Failure to do so shall not relieve the Bidders from responsibility to estimate properly the cost of performing the work within the provided timeframe. Company (OIL) will assume no responsibility for any understandings or representations concerning conditions made by any of their officers prior to award of the Contract. Company (OIL) shall not permit any Changes to the time schedule of the Contract or any financial adjustments arising from the Bidder's lack of knowledge and its effect on the cost of execution of the Contract.

2.36 SPECIFICATIONS: Before submission of Bids, Bidders are requested to make themselves fully conversant with all Conditions of the Bid Document and other relevant information related to the works/services to be executed under the contract.

2.37 PURCHASE PREFERENCE: Purchase Preference will be applicable as per latest Govt. Guidelines. Bidders to take note of the same and quote accordingly. It is Bidder’s responsibility to submit necessary documents from the Competent Authority to establish that they are eligible for purchase preference against this tender.

2.38 PRICE PREFERENCE: Price Preference will be applicable as per latest Govt. Guidelines. Bidders to take note of the same and quote accordingly. It is Bidder's responsibility to submit necessary documents from the Competent Authority to establish that they are eligible for price preference against this tender.

2.39 PURCHASE PREFERENCE ON LOCAL CONTENT: This tender will be governed by the Purchase preference policy (linked with Local Content) (PP-LC) of Ministry of Petroleum & Natural Gas, Government of India. Indian Bidders are advised to refer notification no. O-27011/44/2016-ONG-II/FP dtd. 25.04.2017 and subsequent amendments, if any, and submit the necessary documents, declaration, undertaking etc. as per the policy guidelines along with their bid. As per the PP-LC policy, 50% of the tendered quantity would be awarded to the lowest techno-commercially qualified LC (Local Content) manufacturer / supplier which are within the price band of 10% of the L1, subject to matching the L1 price.
Bidders seeking Purchase preference (linked with Local Content) (PP-LC) shall be required to meet / exceed the target of Local Content (LC) as per values furnished vide original notification of the policy and subsequent amendments applicable as on the bid closing date. The remaining quantity will be awarded to L1 (i.e. Non-Local Content (NLC) manufacturer / supplier not meeting prescribed LC criteria). In case a bidder is eligible to seek benefits under PP-LC policy as well as Public Procurement Policy for MSEs-Order 2012, then the bidders should categorically seek benefits against only one of the two policies i.e. either PP-LC or MSE policy. If a bidder seeks EMD exemption under the MSE policy, then it shall be considered that the bidder has sought benefit against the MSE policy and this option once exercised cannot be modified subsequently. Evaluation of bids with reference to PP-LC policy shall be done by OIL based on the documents submitted by the bidder. OIL shall not be responsible for any incorrect/incomplete submission of documents by bidder leading to non-compliance to PP-LC policy and denial of benefits under the policy.

2.40 General Health, Safety and Environment (HSE) aspects will be as per the terms set forth in Appendix-A of the tender document.

2.41 Procedure for obtaining Labour License under Contract Labour (R&A) Act, 1970 & Central Rules-1971 will as per terms set forth in Appendix-B of tender document.

2.42 The User Manual provided on the e-portal on the procedure How to create Response for submitting offer may be referred for guidance.

END OF SECTION-II

SECTION–III

BID EVALUATION CRITERIA

SECTION-III
BID EVALUATION CRITERIA (BEC)

The bid shall conform generally to the specifications and terms and conditions given in this bid document. Bids shall be rejected in case the services offered do not conform to required parameters stipulated in the technical specifications. Notwithstanding the general conformity of the bids to the stipulated specifications, the following requirements will have to be particularly met by the Bidders without which the same will be considered as non-responsive and rejected. Bidders are advised not to take any exception/deviations to the bid document.

A. TECHNICAL CRITERIA:

1.0 The bidder must be in the business of erection, installation, commissioning and O&M of wind and solar plants.

2.0 Such EPC Projects/jobs/work(s) referenced for qualification in aforesaid para, must involve Engineering (detail engineering is mandatory), Procurement, Project management, Construction management including fabrication, transportation, installation, hook-up, testing, pre-commissioning, start-up, commissioning & PGTR (performance guarantee & test run).

3.0 The Bidder must have Experience of having successfully executed one similar job as mentioned in aforesaid para of value not less than INR 250.50 Cr. by the bidders in the last 07 (Seven) years to be reckoned from the original Bid Closing date. The project, for which the above experience is claimed, should have been satisfactorily completed and/ or handed over / commissioned prior to the date of bid closing. Here similar works means wind power or/and solar projects covering supply, erection testing commissioning and comprehensive O&M for a period of minimum 5 years.

4.0 The bidder must be a manufacturer of wind energy equipment; the offered model of WEG shall be of 1500 KW rating or above and a manufacturer of SPV modules with minimum designing, manufacturing and testing capabilities required for setting up the 10 MW (AC) Solar Project. And meets the experience criteria as described

OR

System Integrator cum EPC contractor who have designed, engineered, installed tested and commissioned using tier one quality products for at least 10 MW (AC) Grid Connected Solar Power plants of offered technology.

5.0 The bidder must have successfully designed, engineered, manufactured, supplied, erected and commissioned, on turnkey basis, Wind Power Project of aggregate capacity not less than 20.5 MW comprising of wind electric generators (WEGs) of unit rating of 1500 KW or above in any one year in the last 7 (seven) years as on Bid Closing Date and also should have experience of Minimum one number Grid connected Solar PV power plant of not less than 7 MW or more capacity from concept to commissioning (i.e. designed, erected, tested and commissioned) during the last seven (07) years from the original date of bid closing.

6.0 The offered rating of WEGs should have been installed by the bidder and must have been working satisfactorily since last 2 (two) years and offered Model (of same rating) should have been commissioned as on the date of submission of the bid and Minimum

one SPV Power Project of at least 10 MW (AC) capacity commissioned by the bidder in India, should be working successfully for at least one year from its date of commissioning from the original date of submission of the bid.

7.0 The bidder must be presently in the business of operation & maintenance (O&M) of wind farms and must have the experience of successful operation and maintenance of at least one wind farm of 20.5 MW capacity or above in India, having WEGs of 1500KW capacity or above, for a period of at least 1 (one) year during last 7(seven) years period as on the Bid Closing Date and Minimum one SPV Power Project of at least 7 MW capacity commissioned by the bidder in India, should be working successfully for at least one year from its date of commissioning from the original date of bid closing.

8.0 The quoted model of WEG must have Type Certification from an accredited test house such as RISO Denmark, DEWI- Germany, Germanischer LLOYD- Germany, NIWE or any other agency approved by Ministry of New and Renewable Energy (MNRE), Government of India. Such Type Certificate must be valid as on the Bid Closing Date. Copy of Type Certificate along with copy certified power curve shall be submitted with the bid. Certified power curve should be in graphics as well as tabular form.

9.0 The bidder must have its name & the offered model included in the latest list of "Manufacturers of Wind Electric Generators / Wind Turbine equipment" in Table 'A' published by Ministry of New & Renewable Energy (MNRE), Government of India.

10.0 The stabilized output of the offered Solar PV plant should not be less than 14 MW (AC) and for the Wind Plant 41MW (AC) ± 5% under standard conditions.

11.0 The bidder must be in possession of suitable and adequate land for the Wind plant, either government land on lease or private land, required for installation of the project. The land must have clear title and free from any encumbrances, encroachments or litigation. The bidder may have any of the following arrangements for having the land.

12.0 Bidder already having possession of land in his own name.

13.0 Allotment letter of revenue land in bidder's own name by the Government or by competent authority. If allotment letter is not available, then recommendation for allotment of land from the nodal agency will be considered subject to submission of allotment letter within 60 (sixty) days of techno commercial bid opening.

13.1 A categorical confirmation in this regard have to be submitted by the bidder without which offer will not be considered for further evaluation.

14.0 An Agreement with a third party (an individual or company) who is/are either in possession of private land or have been allotted Government land along with commitment to transfer such land to OIL INDIA without any consideration. The bidder shall furnish land details, Agreement with third party and commitment of the third party with his bid.

15.0 Copy of sale deed in case of private land and a copy of allotment letter in case of Government land shall also be furnished with the bid.

16.0 In case of Forest land, the bidder must have at least Stage-1 clearance from the Ministry of Environment and Forests.

17.0 Bidders should submit all land related documents along with technical bid in OIL's e-portal.

18.0 The bidder must give an undertaking that he will arrange the requisite land for the solar plant in the vicinity of the site offered for Wind Plant within 06 (Six) months from the date of issue of LoA.

18.1 A categorical confirmation in this regard have to be submitted by the bidder without which offer will not be considered for further evaluation.

19.0 Indian Company/Indian Joint Venture Company as bidder: In case the bidder is an Indian Company/Indian Joint Venture Company, either the Indian Company/Indian Joint Venture Company or its Technical Collaborator/ Joint venture partner must meet the criteria under above clauses.

i. Details of experience and past performance of the bidder and the collaborator (in case of collaboration) or of joint venture partner (in case of a joint venture), on works/jobs done of similar nature in the past and details of current work in hand and other contractual commitments, indicating areas and clients are to be submitted along with the Technical Bid, in support of the experience criteria laid down above.

ii. Indian Companies/Joint Venture Companies: Indian bidders whose proposal for technical collaboration/joint venture involves foreign equity participation or payment of royalty and / or lump sum for technical know-how and wherever Govt. approval is necessary, are required to submit copy of Govt. approval, on their application submitted to SIA, prior to the date of price bid opening. Bidder must submit along with their technical bid Memorandum of Understanding (MOU)/Agreement with their technical collaborator / Joint venture partner (in case of Joint venture) clearly indicating their roles & responsibilities under the scope of work.

iii. MOU/Agreement concluded by the bidder with technical collaborator/joint venture partner (in case of Joint Venture), must also be addressed to the Company, clearly stating that the MOU Agreement is applicable to this tender and shall be binding on them for the entire contract period. Notwithstanding the MOU/Agreement, the responsibility of completion of job under this contract will be with the bidder.

iv. The MOU/Agreement should be legally valid i.e. it should be on a non-judicial stamp paper and notarised. In case of involvement of overseas bidder, the MOU / Agreement should be notarised / endorsed by Indian Embassy.

20.0 **In case the Bidder is a Consortium of Companies, the following requirements must be satisfied** by **the Bidder**:

In case of consortium bidding the members of the consortium should not be more than three. One of the members should be the leader of the consortium. The leader of the consortium can submit bid on behalf of consortium of bidders. Memorandum of Understanding (MOU) between the consortium members duly executed by the CEOs or authorized representative of the consortium members must accompany the bid which should clearly define role/scope of work of each partner/member and should clearly define the leader of the consortium and also authorizing the leader for signing and submission of Bid on their behalf. Memorandum of Understanding (MOU) must also state that all the members of consortium shall be jointly and severally responsible for discharging all obligations under the contract. However, the leader of the consortium must submit an undertaking along with the technical bid towards unconditional acceptance of full responsibility for executing the 'Scope of Work' of this bid document.

The division in scope of work among Consortium Members shall commensurate with their past experience. The overall Project Management shall be performed by the Leader. All Members of the Consortium shall assume responsibility jointly and severally and shall submit Agreement/MOU along with the Bid clearly defining the scope and responsibility of each member along with nomination of the Leader. This Agreement/MOU must remain in force at least till the end of Defects Liability Period and shall be extended if required as per the Company's advice. The following provisions should also be incorporated in the MOU executed by the members of the consortium:

(i) In case of Consortium bidding, the Bidder is defined as a consortium of Solar & Wind manufacturers and developers with maximum 3 members. The leader of the Consortium may be either a solar or wind manufacturer/developer and he should meet the experience criteria of his respective stream (i.e. Wind / Solar). The other consortium member shall meet the experience criteria of the remaining stream i.e. wind / Solar. The Financial criteria (value) will be met by the leader of the Consortium only.

(ii) Only the leader of the consortium shall submit bid on behalf of the consortium. The other members of the consortium shall rectify all the acts and decision of the Leader of the Consortium, which are taken in connection with and/or during the evaluation of the tender and execution of the contract.

(iii) The bid security shall be in the name of the leader of the consortium on behalf of consortium with specific reference to consortium bid and name & address of consortium members. Similarly, the performance security shall be in the name of the leader on behalf of the consortium.

(iv) The leader of the consortium on behalf of the consortium shall coordinate with OIL during the period the bid is under evaluation as well as during the execution of works in the event contract is awarded and he shall also be responsible for resolving dispute/misunderstanding/undefined activities, if any, amongst all the consortium members.

(v) Any correspondence exchanged with the leader of consortium shall be binding on all the consortium /joint venture members.

(vi) Payment shall be made by OIL only to the leader of the consortium towards fulfilment of the contract obligation.

(vii) In case of consortium bids, the bid shall be digitally signed by the authorized representative of the leader of the consortium. The power of Attorney from each member authorizing the leader for signing and submission of Bid on behalf of individual member must accompany the bid, if the same is not mentioned in the MOU submitted along with the bid.

(viii) Document/details pertaining to qualification of the bidder of document attached with the bidding documents must be furnished by each partner/member of consortium complete in all respects along with the bid clearly bringing up their experience especially in the form of work in their scope.

(ix) The Consortium Leader and the distribution of work will be identified and set forth in the bid and will not be permitted to change thereafter without the consent of the Company. No change in project plans, time tables or pricing will be permitted as a consequence of any withdrawal or failure to perform by a Consortium Member.

(x) **Constitution of consortium**: If during the evaluation of bid, a consortium leader proposes any alterations/changes in the constitution or replacement or inclusion

or expulsion of any partner(s)/member(s) of the consortium which had originally submitted the bid, to drive some advantages/benefits based on any development(s) having come to knowledge at any time, the bid of such a consortium shall be liable for rejection.

(xi) **Signing of contract:** In the event of award of contract to the consortium, the contract to be signed by all the members of the consortium and the liability shall be binding to each member of the consortium jointly and severely.

(xii) Members of the consortium are not allowed to quote separately/independently against this tender. All the bids received in such case will be summarily rejected. Further, all bids from parties with technical support from the same principal/Subsidiary/Co-Subsidiary/Sister subsidiary will be rejected. Joint venture partnership / collaboration, with a firm bidding as an independent identity against this tender, will not be accepted.

(xiii) The consortium partners should satisfy the experience criteria as per Clauses above in their respective domain.

(xiv) Certified copies (attested by Director/Company Secretary) of Board resolutions passed by respective Board of Directors of the companies (Consortium leader and members) agreeing to entering into such consortium with each other for submission of bid for the NIT and authorising designated executives of each company to sign in the MOU to be provided along with the technical bid.

(xv) The MOU/Agreement should be legally valid i.e. it should be on a non-judicial stamp paper and notarised. In case of involvement of overseas bidder, the MOU / Agreement should be notarised / endorsed by Indian Embassy.

21.0 **Eligibility criteria in case Bid is submitted on the basis of the Technical Experience of the Parent/Subsidiary Company:** Offers of those bidders who themselves do not meet experience criteria as stipulated in clauses 1.0 to 14.0 above can also be considered provided the bidder is a wholly subsidiary company of the parent company which meets the above mentioned experience criteria or the parent company can also be considered on the strength of its wholly subsidiary company. However, the parent/subsidiary company of the bidder should on its own meet the technical experience as aforesaid and should not rely on its sister subsidiary/co-subsidiary company or through any other arrangement like technical collaboration etc. In that case, as the subsidiary company is dependent upon the technical experience of the parent company or vice-versa, with a view to ensure commitment and involvement of the parent/subsidiary company for successful execution of the contract, the participating bidder must enclose an agreement, as per format furnished vide **Attachment-I,** between the parent and the subsidiary company or vice-versa and Parent/Subsidiary Guarantee, as per format furnished vide **Attachment-II**, from the parent/subsidiary company to OIL for fulfilling the obligations under the agreement, along with the technical bid.

22.0 **Eligibility criteria in case Bid is submitted on the basis of the Technical Experience of Sister Subsidiary/Co-Subsidiary Company:** Offers of those bidders who themselves do not meet the technical experience criteria stipulated in clauses 1.0 to 14.0 above can also be considered based on the experience of their Sister Subsidiary/Co-Subsidiary company within the ultimate parent/holding company subject to meeting the following conditions:

(a) Provided that the sister subsidiary/co-subsidiary company and the bidding company are both wholly subsidiaries of an ultimate parent/holding company either directly or through intermediate wholly subsidiaries of the ultimate parent/holding company or

through any other wholly subsidiary company within the ultimate parent/holding company. Documentary evidence to this effect to be submitted by the ultimate parent/holding company along with the technical bid.

(b) Provided that the sister subsidiary/co-subsidiary company on its own meets the technical experience criteria laid down in clauses 1.0 to 14.0 above and not through any other arrangement like technical collaboration etc.

(c) Provided that with a view to ensure commitment and involvement of the ultimate parent/holding company for successful execution of the contract, the participating bidder must submit an agreement, as per format furnished vide **Attachment-III**, between them, their ultimate parent/holding company, along with the technical bid.

A. <u>In both the situations mentioned in 2.2 and 2.3 above, following conditions are required to be fulfilled /documents to be submitted:</u>

A-1. Undertaking by ultimate parent to provide a Performance Security (as per format enclosed as ANNEXURE-III), equivalent to 50% of the value of the Performance Security which is to be submitted by the bidding company, in case the supported bidding company is the successful bidder. In cases where foreign based ultimate parent does not have Permanent Establishment in India, the bidding company can furnish Performance Security for an amount which is sum of Performance Security amount to be submitted by the bidder and additional 50% Performance Security amount required to be submitted by the ultimate parent. In such case bidding company shall furnish an undertaking that their foreign based ultimate parent is not having any Permanent Establishment in India in terms of Income Tax Act of India.

A-2. Undertaking from the ultimate parent to the effect that in addition to invoking the Performance Security submitted by the contractor, the Performance Security provided by ultimate parent shall be invoked by OIL due to non-performance of the contractor.

<u>Note: In case ultimate parent fails to submit Performance Bank Guarantee as per A-1. Above, Bid Security submitted by the bidder shall be forfeited.</u>

23.0 The bids will be technically evaluated based on the requirements furnished in Scope of Work/Terms of Reference. Bids which do not conform to the minimum specifications of equipment, hardware and software furnished therein and do not include all the jobs/services mentioned in the tender document will be considered as incomplete and rejected.

24.0 Bidder must submit detailed Bio-data of all key personnel to be deployed for the whole period of the project, along with the technical bid. Bidder shall deploy the same persons whose Bio-data is offered in the bid. They shall not be replaced or transferred without prior notification to the Company. Company's approval is essential in case they are desired to be replaced by the bidder with equally competent persons satisfying minimum experience criteria and Company's decision in this regard will be final.

B. <u>FINANCIAL CRITERIA:</u>

1.0 Annual Financial Turnover of the bidder during any of preceding three financial/ accounting years from the original bid closing date should be at least **INR 167 Cr.** In case of consortium At least one (01) member of the consortium to meet above criteria

of annual financial turnover of at least INR 167 Cr. The other members of the consortium should meet minimum criteria of annual turnover of **INR 83.5 Cr.**

2.0 Net Worth of the bidder: It should be minimum **INR 50.1 Cr.**, as per immediate preceding audited financial year result. In case of consortium, the Net Worth of all the members of the consortium should be positive. The members of consortium collectively should meet the net worth minimum **INR 50.1 Cr.**, as per immediate preceding audited financial year result. Net worth of individual members of the consortium should be positive on stand-alone basis.

Net worth shall mean: " Share capital + Reserves created out of profits and securities Premium - account (excluding revaluation reserves) - deferred expenditure - Miscellaneous Expenditure to the extent not written off and carried forward Loss - Reserves created out of write back of depreciation and amalgamation".

3.0 Documentary evidence in the form of Audited Balance Sheet and Profit & Loss Account for the preceding 03 (three) financial/accounting years should be submitted along with the technical bid.

Considering the time required for preparation of Financial Statements, if the last date of preceding financial / accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial / accounting year are not available with the bidder, then the financial turnover of the previous three financial / accounting years excluding the preceding financial / accounting year will be considered. In such cases, the Net worth of the previous financial / accounting year excluding the preceding financial / accounting year will be considered. However, the bidder has to submit an affidavit/undertaking certifying that 'the balance sheet/Financial Statements for the financial year ..... (as the case may be) has actually not been audited so far'.

Notes:

(a) For proof of Annual Turnover & Net worth any one of the following document must be submitted along with the bid: -

i) A certificate issued by a practicing Chartered / Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual turnover & Net worth.

ii) Audited Balance Sheet along with Profit & Loss account. In case of foreign bidders, self-attested/ digitally signed printed published accounts are also acceptable.

(b) In case the bidder is a Central Govt. Organization/PSU/State Govt. Organization/Semi-State Govt. Organization or any other Central/State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidence for the same.

4.0 In case the Bidder is subsidiary company (should be a wholly owned subsidiary of the parent/ultimate parent/holding company) who does not meet financial criteria by itself and submits his bid based on the strength of his parent/ultimate parent/holding company, then following documents need to be submitted.

i) Turnover of the parent/ultimate parent/holding company should be in line with Para 1.0 above.

ii) Net Worth of the parent/ultimate parent/holding company should be in line with para 2.0 above.

iii) Corporate Guarantee on parent/ultimate parent/holding company's company letter head signed by an authorised official undertaking that they would financially support their wholly owned subsidiary company for executing the project/job in case the same is awarded to them.

iv) Document of subsidiary company towards wholly owned subsidiary of the parent/ultimate parent/holding company.

5.0 Working Capital:

i) The bidder should have minimum working capital equal to INR 50.1 Crore, as per immediate proceeding audited financial year result. In case the working capital is short the bidder can supplement the same through line of credit from a scheduled commercial bank having net worth more than 100 Crores as per enclosed format.

ii) In the event of award, the contractor shall open a project specific account in a nationalized bank located in the vicinity where the project is executed. The contractor shall deposit an amount equal to 10% of the annualized contract value within 15 days from the date of issue of LOA. All payment against the contract shall be remitted to the project specific account. Any withdrawal from this account shall be only after the first payment against the contract is made by OIL.

iii) At any point of time the minimum balance after first remittance by OIL against invoice from the contractor shall remain 5% of the annualized contract value.

iv) In addition to above the bidder should submit a financial resource/cash flow plan for execution of this contract.

v) Working Capital shall mean "Current Assets minus Current liabilities" as per latest year's audited consolidated annual Financial Statements.

6.0 Bid Capacity:

The bidding capacity of the contractor should be equal to or more than the **INR 334 Cr**. The bidding capacity shall be worked out by the following formula:

Bidding Capacity = [A x 1.5] - B

Where,

A = Maximum annual turnover in any one of the preceding three financial years

B = Commitments in next twelve months from the date of expiry of the bid

Validity as per BRS 30.

Notes:

1. The bidder shall furnish documentary evidence by way of copies of Contract / Purchase Order, Completion Certificate or any other equivalent document which can substantiate their claim towards experience, Audited Balance Sheet and Profit & Loss Account etc. along with

the Bid to establish experience / track record and financial capabilities meeting Bid Rejection Criteria.

2. In additional compliance to financial criteria the bidder should submit a financial resource/cash flow plan for execution.

3. The bidder or its Proprietor/ Partner(s)/ Director(s) of the Firm should not have been convicted by a Court of Law for an offence involving moral turpitude in relation to business dealings during the past seven (7) years. The bidder shall give an affidavit to this effect. The affidavit must be affirmed before the competent judicial authority or duly notarized by the Notary. Besides, bidder should furnish litigation history of their firm or group firm (if claiming fulfillment of BRC on group entity terms). The litigation history shall include:

   (i) Arbitration cases pending.

   (ii) Disputed incomplete works.

   (iii) Pending civil cases against the firm and/or its Proprietor / Partner(s) / Director(s) involving moral turpitude in relation to business dealings.

   (iv) Pending criminal cases against the firm and / or its Proprietor / Partner(s) / Director(s) involving moral turpitude in relation to business dealings.

   (v) Punishments awarded under civil cases and/or criminal cases involving moral turpitude in relation to business dealings to the firm and/or its Proprietor/ Partner(s)/ Director(s).

4. The bidder should meet all the above requirements /criteria as on the bid due date. The bids of only those bidders, who meet the above requirements / criteria, will be considered for further evaluation.

5. **Other confirmations from bidder:** While submitting his bid, bidder will have to provide categorical confirmation to below requirements; otherwise his bid will be rejected.

   a) The successful Bidder is required to open a 'separate account' with any scheduled/nationalized bank in Jodhpur wherein all receipts and payments in respect of the Contract are to be routed through this account only.

   b) The RA bills of the contractor will be processed when the monthly bank account statements are submitted to OIL along with the bill and it is established that the withdrawn money has been utilized only for the project work. Along with each RA bill the EPC will have to submit the proof of payments being made to its sub-vendors and sub-contractors.

   c) If during the course of the project execution, it is established that the project progress is getting affected due to non-payment by EPC to its sub-vendors and sub-contractors than OIL will have the right to make direct payments to these sub-vendors and sub-contractors from EPC contractor RA bill final payable amount (after effecting statutory deductions as applicable) at total and risk and cost of EPC.

   d) The bidder will not be able to use this account for entering into any type of mortgage/loan/factoring arrangement with other financial institutions during the course of the contract execution with OIL without the written consent of OIL.

C. <u>COMMERCIAL CRITERIA</u>:

The following vital commercial criteria should be strictly complied with failing which the bid will be rejected:

1.0 Bids shall be submitted under single stage two bid system i.e., Technical Bid and Priced Bid separately. Bids shall be rejected outright if the prices are indicated in the technical bids or if not conforming to this two bid system.

2.0 Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.

3.0 Bids should be valid for minimum 270 days from the original bid closing date. Bids with shorter validity shall be rejected as being non-responsive.

4.0 Bid Security in Original (valuing INR 2,75,00,000.00 and valid for 300 days from the original bid closing date) shall be furnished as a part of the Technical Bid and shall reach OIL's office at Jodhpur before bid closing date & time. A scanned copy of the bid security shall however be uploaded in OIL's E-Procurement portal along with the Technical Bid. The amount of Bid Security shall be as specified in the Forwarding Letter of the Bid Document. Bid without proper & valid Bid Security shall be rejected. Bid security can also be submitted through OIL's e-tender portal. Bid security amount can also be transferred through online transfer to the designated bank account of OIL, Rajasthan Fields after obtaining necessary clearance from the tendering authority of OIL at Jodhpur, Rajasthan. Bids received without bid security or with bid security with lesser value or validity shall be rejected straightaway.

5.0 The Integrity Pact must be uploaded in OIL's E-Procurement portal along with the Technical Bid duly signed by the same signatory who signed the Bid i.e. who is duly authorized to sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit the Integrity Pact, their bid shall be rejected straightway.

6.0 Performance security is applicable against this tender. Bidder to refer the related clause for Performance Security under "Instructions to Bidders" and confirm their unconditional compliance to the same. Bids failing to comply to the aforesaid clause shall be considered non-responsive and rejected straightaway.

7.0 Bids received through the e-procurement portal shall only be accepted. Bids received in any other from shall not be accepted.

8.0 Bids submitted after the Bid Closing Date and Time shall be rejected.

9.0 The bid documents are not transferable. Bids made by bidders who have not been issued the Bid documents from the Company shall be rejected.

10.0 Bids shall be typed or written in indelible ink and shall be digitally signed by the bidder or his authorized representative.

11.0 Bids shall contain no interlineations, erasures or over writing except as necessary to correct errors made by bidders, in which case such corrections shall be initialled by the person(s) signing the Bid.

12.0 Bidders shall bear, within the quoted rates, the personal tax as applicable in respect of their personnel and Sub-Contractor's personnel, arising out of execution of the contract.

13.0 Bidders shall bear, within the quoted rate, the corporate tax as applicable on the income from the contract.

14.0 Bidders shall quote their price exclusive of GST. The GST amount on the taxable part of the goods/services provided by the Contractor shall be paid by the Company as per provisions of the GST Act.

15.0 Any Bid containing false statement shall be rejected.

16.0 Bidders must quote clearly and strictly in accordance with the price schedule outlined in "Price Bid Format" of Bid Document; otherwise the Bid will be summarily rejected.

17.0 Bidder must accept and comply with the following clauses as given in the Bid Document in to failing which bid will be rejected –

i) Performance Guarantee Clause
ii) Force Majeure Clause
iii) Tax Liabilities Clause
iv) Arbitration Clause
v) Acceptance of Jurisdiction and Applicable Law
vi) Liquidated damage and penalty clause
vii) Safety & Labor Law
viii) Termination Clause
ix) Integrity Pact
x) Withholding Clause

18.0 Indian Bidders, whose proposal for technical collaboration/joint venture involves foreign equity participation or payment of royalty and/or lump sum for technical know- how and wherever Govt. approval is necessary, are required to submit copy of Govt. approval on their application prior to date of price-bid opening.

D. GENERAL

1.0 The “Statement of Compliance” should be digitally signed and uploaded along with the Technical Bid (un-priced). In case bidder takes exception to any clause of Tender Document not covered under BEC, then the Company has the discretion to load or reject the offer on account of such exception if the Bidder does not withdraw/modify the deviation when/as advised by the Company. The loading so done by the Company will be final and binding on the Bidders.

2.0 To ascertain the substantial responsiveness of the Bid the Company reserves the right to ask the Bidder for clarification in respect of clauses covered under BEC also and such clarifications fulfilling the BEC clauses in totality must be received on or before the deadline given by the Company, failing which the offer will be summarily rejected.

3.0 Any exception or deviation to the Tender requirements must be tabulated in the ANNEXURE-XV for Exception/Deviation provided in the tender document, by the Bidder, in their Technical Bid only. Any additional information, terms or conditions included in the Commercial (Priced) Bid will not be considered by OIL for evaluation of the Tender.

4.0 The Company reserves the right to cancel/withdraw the tender or annul the bidding process at any time prior to award of contract, without thereby incurring any liability to the bidders or any obligation to inform the bidders of the grounds of Company's action.

5.0 If any clauses in the BEC contradict clauses elsewhere in the Bid Document, then the clauses in the BEC shall prevail.

E. DOCUMENTS ALONG WITH BID:

Bidders must furnish documentary evidences in support of fulfilling the entire above requirement as under:

a) P.O/Work Order and job Completion Certificate or any other documents from their clients which can substantiate their claim towards experience.

b) Company Profile, address, concerned person and his/her contact details, organizational set up with details of professional technical and financial capabilities.

c) Documents in the form of copies of relevant pages of Contract and Completion Certificate or final bill payment documents etc. or any other documents issued by their clients in support of executing the job as mentioned in the Scope of Work/Terms of Reference/Technical Specification of the bidding document, during last 7 years prior to the bid closing date of the tender.

d) Bidder will have to submit Project Execution & Management / Planning & Scheduling methodology for the project.

e) Proposed Overall Project Schedule (from the date of LOA till final commissioning and handover in line with project duration specified in the tender) in network form showing all the details.

f) Organizational set up for Planning, Scheduling, Procurement & Project Management, Construction Management, Quality Management, Inspection & Expediting and Monitoring & Control at LSTK Contractor's Design Office and Site Office.

g) Resource Deployment plan to meet the project plan as per schedule.

h) Software's to be used by bidder for planning and material control with license details.

i) Health, Safety and Environment (HSE) policies, implementation procedures in line with internationally accepted practices and statistics covering the last five (5) years.

j) LTIFR track record for last three (3) years.

k) List of policies, procedures and quality assurance & quality control practices currently in place for execution of similar work.

2.43 **BID EVALUATION METHODOLOGY**

(A) Bid Evaluation Methodology (Wind Project)

Evaluation of techno-commercial bids and priced bids shall be done separately.

1. Evaluation of Techno-commercial bids shall be carried out first. This will be done on the basis of Bid Rejection Criteria, documents furnished by the bidder and completeness & conformity of the bids with respect to the ITB requirements.

2. Price bids of only qualified and techno-commercially acceptable bidders shall be opened.
3. Price evaluation of the bids shall be carried out by calculating overall cost per KWh with following consideration

   a. Total EPC contract price quoted by bidder as per Price Schedule P-I.

   b. Total O&M charges as per Price Schedule P-II for 25 years quoted by the bidder on NPV basis.

   c. Other charges such as Land lease, Chief Electrical Inspector fees, Nodal Agency, DISCOM charges, TARNSCO charges, S &F charges etc. quoted by the bidder.

   d. Total Annual Energy Production (AEP) at P-90 for 25 years as arrived at by the Owner / Consultant after effecting corrections in the AEP furnished by the bidders.

   e. Discount factor of 10.0% annually shall be considered

   f. Information / data furnished by the bidders in Bid Response Sheets.

   g. Any other point which may have financial bearing on overall return of the project can also be considered in the evaluation.

   h. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between sub totals and the total price, (even in case of carry forward of prices) the unit or subtotal price shall prevail and the total price shall be corrected accordingly. If there is a discrepancy between words and figures, the amount in words will prevail. If the Bidder does not accept such correction of errors, its bid will be rejected and the bid security will be forfeited

   i. Methodology of calculation of Evaluated Bid Value, EBV, (Cost per kWh)

   Cost per kWh will be calculated based on CAPEX and OPEX as quoted by bidder for the Guaranteed Baseline Annual Saleable Energy at metering point accepted by OIL. The following methodology will be used for calculating the Cost per kWh.

   The Evaluated Bid Value (EBV) shall be calculated using the following parameters:

S. No.	Symbol	Details of parameters
1	X1	Quoted EPC Price by Bidder inclusive of all taxes / duties etc. (As per Price Schedule P-I) in INR Lakh
2	X2	NPV of Quoted Comprehensive O&M charges including Statutory, others and S&F charges for 25 years (As per Price Schedule PII) considering discount factor as given above in INR Lakh
3	Y	Annual Energy Production (AEP) of Wind Farm as per clause 5.28 for each year during the O&M period as per stipulated evaluation criteria of tender
4	Y1	Total Energy Generation of wind project for 25 years in Lakh kWh (LU)
5	EBV (E1) (Cost per kWh)	(X1+X2) / Y1

A. BID EVALUATION METHODOLOGY (Solar Project)

Evaluation of techno-commercial bids and priced bids shall be done separately.

1. Evaluation of Techno-commercial bids shall be carried out first. This will be done on the basis of Bid Rejection Criteria, documents furnished by the bidder and completeness & conformity of the bids with respect to the ITB requirements.
2. Price bids of only qualified and techno-commercially acceptable bidders shall be opened.
3. Financial evaluation of the bids shall be carried out by Cost per KWh basis with the following consideration
   a. Total EPC contract price quoted by bidder as per Price Schedule P-1.
   b. Total O&M charges as per Price Schedule P-2 for 25 years including statutory charges if any quoted by the bidder.
   c. Other charges such as Land lease, Chief Electrical Inspector fees, Nodal Agency, DISCOM charges, TARNSCO charges, S &F charges etc. quoted by the bidder
   d. The bidder shall furnish Net Electrical Energy generation guaranteed (NEEGG)/AEP for 25 years based on the Performance Ratio (PR) offered by the bidder for the plant.
   e. Total Annual Energy Production (AEP) at P-90 for 25 years as guaranteed by bidder and arrived at by the Owner / Consultant after effecting corrections in the AEP furnished by the bidders, or

      AEP shall be calculated as follows

      AEP = Nominal Annual Energy Production in kWh X PR

      Nominal Annual Energy Production in kWh = Annual Cumulative Solar Irradiation intensity (KWhr/m2) X Generator area of the PV plant (m2) X Efficiency factor of the PV modules
   f. Discount factor of 10% annually
   g. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between sub totals and the total price, (even in case of carry forward of prices) the unit or subtotal price shall prevail and the total price shall be corrected accordingly. If there is a discrepancy between words and figures, the amount in words will prevail. If the Bidder does not accept such correction of errors, its bid will be rejected and the bid security will be forfeited
   h. Methodology of calculation of Evaluated Bid Value, EBV (Cost per kWh)

      Cost per kWh will be calculated based on CAPEX and OPEX as quoted by bidder for the Guaranteed Baseline Annual Saleable Energy at metering point specified by the bidder. The following methodology will be used for calculating the Cost per kWh.

The Evaluated Bid Value (EBV) shall be calculated using the following parameters:

S. No.	Symbol	Details of parameters
1	X3	Quoted EPC Price by Bidder inclusive of all taxes / duties etc. (As per Price Schedule P-1) in INR Lakh
2	X4	NPV of Quoted Comprehensive O&M charges including Statutory, others and S&F charges for 25 years (As per Price Schedule P-2) considering discount factor as given above in INR Lakh
3	Z1	Total Energy Generation of Solar project for 25 years in Lakh kWh (LU)
4	EBV (E2) (Cost per kWh)	(X3+X4) / Z1

B. COMBINED BID EVALUATION OF HYBRID PROJECT

1. Pro-rate Average cost per kWh will be calculated for hybrid project as per details given below:

   E= (E1*Y1 +E2*Z1)/ (Y1+Z1)

   Where in

   E is the evaluated average cost per kWh

   E1 is evaluated cost per kWh and Y1 is AEP of Wind Project

   E2 is evaluated cost per kWh and Z1 is AEP of Solar Project

2. All the bids shall be arranged in ascending order for the value of INR Per kWh. Order can be placed on the bidder whose average cost per kWh is found to be the lowest for total hybrid project based on Cost per KWh found to be lowest up to three decimal points.
3. Based on the Price discovered and Bid evaluation OIL will further work out IRR based on tariff to be quoted to REMCL. OIL reserves the right to negotiate the price with the lowest bidder to arrive at a tariff which will provide the required minimum IRR as per the guidelines of OIL management.
4. In case of inability of the lowest bidder to arrive at the price in order to enable OIL to achieve the desired IRR with the price to be quoted to REMCL, OIL will have the option to negotiate with the L2 bidder and so on. OIL will decide placement of orders only after the outcome of REMCL tender.
5. OIL reserves the right to cancel a site without describing any reason based on its own assessment and can accordingly modify the capacity of the project to be awarded in the range of 41 MW +/- 5%.

END OF SECTION-III

SECTION–IV

GENERAL CONDITIONS OF CONTRACT

SECTION- IV

GENERAL CONDITIONS OF CONTRACT

4.0 **DEFINITIONS**:

4.1 In the contract, the following terms shall be interpreted as indicated:

(a) "The Contract" means agreement entered into between Company and Contractor, as recorded in the contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein;

(b) "The Contract Price" means the price payable to Contractor under the contract for the full and proper performance of its contractual obligations;

(c) "Company" or "OIL" or “Owner” means Oil India Limited;

(d) "Contractor" means the Contractor performing the work under this Contract.

(e) "Contractor's Personnel" means the personnel to be provided by the Contractor to provide services as per the contract.

(f) "Company's Personnel" means the personnel to be provided by OIL or OIL's Contractor (other than the Contractor executing the Contract). The Company representatives of OIL are also included in the Company's personnel.

(g) “Contractor’s items” means the manpower and services, which are to be provided by Contractor or to be provided by Company at the expense of the Contractor, which are listed in Tender Document under Terms of Reference and Technical Specifications.

(h) “Company’s items” means the equipment, materials and services, which are to be provided by Company at the expense of Company and listed in the Contract.

(i) “Company Representative” means the person or persons appointed and approved from time to time by the Company to act on its behalf for overall coordination and project management purpose.

(j) "The Work" means each and every activity required for the successful performance of the services described in SECTION-V to SECTION-X.

(k) “Day” means a calendar day of twenty-four (24) consecutive hours beginning at 06:00 hrs. and ending at 06:00 hrs.

(l) “Party” means either the Company or Contractor as the context so permits and, as expressed in the plural, shall mean the Company and Contractor collectively.

(m) “Site” means the land and other places, on/under/ in or through which the works are to be executed by the Contractor and any other land and places provided by the Company for working space or any other purpose as designated hereinafter as forming part of the Site.

(n) "Gross Negligence" means any act or failure to act (whether sole, joint or concurrent) by a person or entity which was intended to cause, or which was in reckless disregard of or wanton indifference to, avoidable and harmful consequences such person or entity knew, or should have known, would result from such act or failure to act. Notwithstanding the foregoing, Gross negligence shall not include any action taken in good faith for the safeguard of life or property.

(o) "Wilful Misconduct" means intentional disregard of good and prudent standards of performance or proper conduct under the Contract with knowledge that it is likely to result in any injury to any person or persons or loss or damage of property.

(p) "Affiliate" means any Person which Controls, or is Controlled by, or under common Control with a Party; "Control" in this context means ownership of more than fifty percent (50%) of the shares of a Person and/or the right to appoint majority directors on Board by contract or otherwise.

(q) "Co-venturers" shall mean any co-venturers with the Company from time to time having an interest in either the PSC and/or a Joint and/or associated contracts for the purposes of exploration and production in Operating Contract the Operating Area and on whose behalf the Company would be deemed to have entered into this Contract.

4.2 **EFFECTIVE DATE, MOBILIZATION TIME/DE-MOBILIZATION TIME, DATE OF COMMENCEMENT OF THE CONTRACT AND DURATION OF CONTRACT:**

4.2.1 **EFFECTIVE DATE OF CONTRACT**: The contract shall become effective as of the date Company notifies the Contractor in writing that it has been awarded the contract. This date of issuance of Letter of Award (LOA) by the Company will be the Effective Date of Contract.

4.2.2 **MOBILIZATION/De-MOBILIZATION TIME OF THE CONTRACT:** The initial mobilization / subsequent mobilization of equipment, material and personnel should be completed by Contractor within 6 months from the date of Letter of Award. Mobilization shall be deemed to be completed when Contractor's manpower is placed at the place of posting in readiness to commence work as envisaged under the contract duly certified by the Company's authorized representative.

4.2.3 **DATE OF COMMENCEMENT OF CONTRACT**: The date on which the mobilization is completed and accepted by the company in all respects will be treated as date of Commencement of Contract.

4.2.4 **DURATION OF CONTRACT**:

a) EPC contract: Eighteen months from date of issue of LOA
b) O&M contract: 25 years from date of stabilization/OAT of whole hybrid project.

4.3 **GENERAL OBLIGATIONS OF CONTRACTOR:** Contractor shall, in accordance with and subject to the terms and conditions of this Contract:

4.3.1 Perform the work described in the SECTIONS-V to X.

4.3.2 Except as otherwise provided in the Terms of Reference and the special Conditions of the contract, provide all labour as required to perform the work.

4.3.3 Perform all other obligations, work and services which are required by the terms of this contract or which reasonably can be implied from such terms as being necessary for the successful and timely completion of the work

4.3.4 Contractor shall be deemed to have satisfied himself before submitting their bid as to the correctness and sufficiency of its bid for the services required and of the rates and prices quoted, which rates and prices shall, except insofar as otherwise provided, cover all its obligations under the contract.

4.3.5 Contractor shall give or provide all necessary supervision during the performance of the services as Company may consider necessary for the proper fulfilling of contractor's obligations under the contract.

4.4 **GENERAL OBLIGATIONS OF THE COMPANY**: Company shall, in accordance with and subject to the terms and conditions of this contract:

4.4.1 Pay Contractor in accordance with terms and conditions of the contract. The period of time for which each rate shall be applicable shall be computed from and to the nearest a day. The rates contained in the Contract shall be based on Contractor’s operation being conducted on a seven (07) days week and a twenty-four (24) hours work day. Under the Contract, Contractor will be entitled to the applicable rate defined in Schedule of Rates. These rates are payable when the required condition has existed for a full month period. If the required condition existed for less than a month then payments shall be made on pro-rata basis.

4.4.2 Allow Contractor access, subject to normal security and safety procedures, to all areas as required for orderly performance of the work.

4.4.3 Perform all other obligations required of Company by the terms of this contract.

4.5 **PERSONNEL TO BE DEPLOYED BY CONTRACTOR**

4.5.1 Contractor warrants that it shall provide competent, qualified and sufficiently experienced personnel to perform the work correctly and efficiently.

4.5.2 The Contractor should ensure that their personnel observe applicable company and statutory safety requirement. Upon Company's written request, contractor, entirely at its own expense, shall remove immediately any personnel of the Contractor determined by the Company to be unsuitable and shall promptly replace such personnel with personnel acceptable to the Company. Replacement personnel should be mobilized within 15 days from the date of issuance of notice without affecting the operation of the company.

4.5.3 The Contractor shall be solely responsible throughout the period of the contract for providing all requirements of their personnel including but not limited to, their transportation to & fro from field/drilling site, enroute/ local boarding, lodging & medical attention etc. Company shall have no responsibility or liability in this regard

4.5.4 Contractor's personnel shall be fluent in English language (both writing and speaking).

4.6 **WARRANTY AND REMEDY OF DEFECTS:**

4.6.1 Contractor warrants that they shall perform the work in a first class, workmanlike, and professional manner and in accordance with the highest degree of quality, efficiency and current state of the art technology/oil field practices and in conformity with all specifications, standards and drawings set forth or referred to in the Terms of Reference and with instructions and guidance which Company may, from time to time, furnish to the Contractor.

4.6.2 Should Company discover at any time during the tenure of the Contract or till completion of demobilization of tools and personnel after issuance of demobilization notice/expiry of contract that the Work does not conform to the foregoing warranty, Contractor shall after receipt of notice from Company, promptly perform any and all corrective work required to make the services conform to the Warranty. Such corrective Work shall be performed entirely at Contractor's own expenses. If such corrective Work is not performed within a reasonable time, the Company, at its option may have such remedial Work performed by others and charge the cost thereof to Contractor which the Contractor must pay promptly. In case Contractor fails to perform remedial work, or pay promptly in respect thereof, the performance security shall be forfeited.

4.7 **CONFIDENTIALITY, USE OF CONTRACT DOCUMENTS AND INFORMATION**:

4.7.1 Contractor or its personnel shall not, without Company's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing pattern, sample or information furnished by or on behalf of Company in connection therewith, to any person other than a person employed by Contractor in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far, as may be necessary for purposes of such performance with prior permission from Company. However, nothing hereinabove contained shall deprive the Contractor of the right to use or disclose any information:

(a) which is possessed by the Contractor, as evidenced by the Contractor's written records, before receipt thereof from the Company which however the Contractor shall immediately inform to Company ; or

(b) which is required to be disclosed by the Contractor pursuant to an order of a court of competent jurisdiction or other governmental agency having the power to order such disclosure, provided the Contractor uses its best efforts to provide timely notice to Company of such order to permit Company an opportunity to contest such order subject to prior permission from Company.

4.7.2 Contractor shall not, without Company's prior written consent, make use of any document or information except for purposes of performing the contract.

4.7.3 Any document supplied to the Contractor in relation to the contract other than the Contract itself remain the property of Company and shall be returned (in all copies) to Company on completion of Contractor's performance under the Contract if so required by Company.

4.7.4 During this Contract, Company and its employees, agents, other contractors, sub-contractors (of any tier) and their employees etc may be exposed to certain Confidential information and data of the Contractor. Such information and data shall held by the Company, its employees, agents, other contractors, sub-contractors (of any tier) and their employees in the strictest Confidence and shall not be disclosed to any other party except on a need to know basis.

4.7.5 However, the above obligation shall not extend to information which:

i) is, at the time of disclosure, known to the public which Contractor shall immediately inform Company ;

ii) is lawfully becomes at a later date known to the public through no fault of Contractor subject to Contractor's undertaking that no information has been divulged by them to the public;

iii) is lawfully possessed by Contractor before receipt thereof from Company which should be immediately informed to Company;

iv) is developed by Contractor independently of the information disclosed by Company which should be shared with the Company;

v) Contractor is required to produce before competent authorities or by court order subject to prior permission from Company;

4.8 **TAXES**:

4.8.1 Tax levied on Contractor as per the provisions of Indian Income Tax Act and any other enactment/rules on income derived/payments received under the contract will be on Contractor's account.

4.8.2 Contractor shall be responsible for payment of personal taxes, if any, for all the personnel deployed in India by Contractor.

4.8.3 The Contractor shall furnish to the Company, if and when called upon to do so, relevant statement of accounts or any other information pertaining to work done under the contract for submitting the same to the Tax authorities, on specific request from them in accordance with provisions under the law. Other than the information provided by the Contractor, the Contractor shall not be responsible for any inaccurate information provided by the Company to the Tax authorities and the Company shall indemnify the Contractor for all claims, expenses, costs or losses of any nature arising from such inaccuracy. Contractor shall be responsible for preparing and filing the return of income etc. within the prescribed time limit to the appropriate authority.

4.8.4 Prior to start of operations under the contract, the Contractor shall furnish the Company with the necessary documents, as asked for by the Company and/ or any other information pertaining to the contract, which may be required to be submitted to the Income Tax authorities at the time of obtaining "No Objection Certificate" for releasing payments to the Contractor.

4.8.5 Corporate income tax will be deducted at source from the invoice at the specified rate of income tax as per the provisions of Indian Income Tax Act as may be in force from time to time and Company will issue TDS Certificate to the Contractor as per the provisions of Income Tax Act.

4.8.6 Corporate and personnel taxes on Contractor shall be the liability of the Contractor and the Company shall not assume any responsibility on this account.

4.8.7 All taxes and levies other than GST shall be borne by the Contractor.

4.8.8 Goods and Services Tax (GST): The quoted price should be exclusive of GST and the GST as applicable shall be to the Company account. The GST amount on the taxable part of the services provided by the Contractor shall be paid by the Company as per provisions of the GST Act. Bidder should take note of the following while submitting their offer in GST regime.

GOODS AND SERVICES TAX:

G1. "GST" shall mean Goods and Services Tax charged on the supply of material(s) and services. The term "GST" shall be construed to include the Integrated Goods and Services Tax (hereinafter referred to as "IGST") or Central Goods and Services Tax (hereinafter referred to as "CGST") or State Goods and Services Tax (hereinafter referred to as "SGST") or Union Territory Goods and Services Tax (hereinafter referred to as "UTGST") depending upon the import / interstate or intrastate supplies, as the case may be. It shall also mean GST compensation Cess, if applicable.

G2. The quoted price shall be deemed to be inclusive of all taxes and duties except "Goods and Services Tax" (hereinafter called GST) (i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and GST compensation Cess if applicable).

G3. Contractor/vendor shall be required to issue tax invoice in accordance with GST Act and/or Rules so that input credit can be availed by OIL (Oil India Limited)/Client. In the event that the contractor / vendor fails to provide the invoice in the form and manner prescribed under the GST Act read with GST Invoicing Rules there under, OIL / Client shall not be liable to make any payment on account of GST against such invoice.

G4. GST shall be paid against receipt of tax invoice and proof of payment of GST to government. In case of non-receipt of tax invoice or non-payment of GST by the contractor/vendor, OIL shall withhold the payment of GST.

G5. GST payable under reverse charge for specified services or goods under GST act or rules, if any, shall not be paid to the contractor/vendor but will be directly deposited to the government by OIL/Client.

G6. Where OIL/client has the obligation to discharge GST liability under reverse charge mechanism and OIL/client has paid or is /liable to pay GST to the Government on which interest or penalties becomes payable as per GST laws for any reason which is not attributable to OIL/client or ITC with respect to such payments is not available to OIL/client for any reason which is not attributable to OIL/client, then OIL/client shall be entitled to deduct/ setoff / recover such amounts against any amounts paid or payable by OIL/Client to Contractor / Supplier.

G7. The Supplier/Contractor shall always comply with the requirements of applicable laws and provide necessary documents as prescribed under the Rules & Regulations, as applicable from time to time. In particular, if any tax credit, refund or other benefit is denied or delayed to OIL / Project Owner due to any non-compliance / delayed compliance by the Supplier under the Goods & Service Tax Act (such as failure to upload the details of the sale on the GSTN portal, failure to pay GST to the Government) or due to non-furnishing or furnishing of incorrect or

incomplete documents by the Supplier, the Supplier shall be liable to reimburse OIL / Project Owner for all such losses and other consequences including, but not limited to the tax loss, interest and penalty.

G8. Notwithstanding anything contained anywhere in the Agreement, in the event that the input tax credit of the GST charged by the Contractor/Vendor is denied by the tax authorities to OIL / Client for reasons attributable to Contractor/Vendor, OIL/client shall be entitled to recover such amount from the Contractor / Vendor by way of adjustment from the next invoice. In addition to the amount of GST, OIL / client shall also be entitled to recover interest at the rate prescribed under GST Act and penalty, in case any penalty is imposed by the tax authorities on OIL / Project Owner.

G9. TDS under GST, if applicable, shall be deducted from contractor's/vendor's bill at applicable rate and a certificate as per rules for tax so deducted shall be provided to the contractor/vendor.

G10. The Contractor will be under obligation for charging correct rate of tax as prescribed under the respective tax laws. Further the Contractor shall avail and pass on benefits of all exemptions/ concessions available under tax laws.

G11. The contractor will be liable to ensure to have registered with the respective tax authorities and to submit self-attested copy of such registration certificate(s) and the Contractor will be responsible for procurement of material in its own registration (GSTIN) and also to issue its own Road Permit/ E-way Bill, if applicable etc.

G12. In case the bidder is covered under Composition Scheme under GST laws, then bidder should quote the price inclusive of the GST (CGST & SGST/UTGST or IGST). Further, such bidder should mention "Cover under composition system" in column for GST (CGST & SGST/UTGST or IGST) of price schedule.

G13. OIL/client will prefer to deal with registered supplier of goods/ services under GST. Therefore, bidders are requested to get themselves registered under GST, if not registered yet. However, in case any unregistered bidder is submitting their bid, their prices will be loaded with applicable GST while evaluation of bid. Where OIL/client is entitled for input credit of GST, the same will be considered for evaluation of bid as per evaluation methodology of tender document.

G14. GST (GOODS & SERVICE TAX) (TRANSPORTATION CHARGES, SUPERVISION / TRAINING, SITE WORK):

The quoted Prices towards Transportation, Supervision, Training, Site Work, AMC shall be inclusive of all taxes &levies except Goods & Service Tax (GST).

Goods & Service Tax (GST) as billed by the Supplier shall be payable at actuals by Owner subject to Contractor furnishing proper tax invoice issued in accordance with Goods & Service Tax (GST) rules to enable Owner to take input tax credit as per Govt. Rules 2004 on Goods & Service Tax (GST) paid.

Goods & Service Tax (GST) shall not be payable, if the requirements as specified above are not fulfilled by the Supplier. In case of non-receipt of above, Owner shall withhold the payment of Goods & Service Tax (GST).

In case of Foreign Bidders, where foreign bidder does not have permanent establishment in India, for supervision/training services by foreign supervisor at Project Site, Goods & Service Tax (GST) shall be paid by Owner to tax authorities.

G15. Documentation requirement for GST

The vendor will be under the obligation for invoicing correct tax rate of tax/duties as prescribed under the GST law to Owner/OIL, and pass on the benefits, if any, after availing input tax credit.

Any invoice issued shall contain the following particulars-

a) Name, address and GSTIN of the supplier;
b) Serial number of the invoice;
c) Date of issue;
d) Name, address and GSTIN or UIN, if registered of the recipient;
e) Name and address of the recipient and the address of the delivery, along with the State and its code,
f) HSN code of goods or Accounting Code of services;
g) Description of goods or services;
h) Quantity in case of goods and unit or Unique Quantity Code thereof;
i) Total value of supply of goods or services or both;
j) Taxable value of supply of goods or services or both taking into discount or abatement if any;
k) Rate of tax (IGST,CGST, SGST/ UTGST, cess);
l) Amount of tax charged in respect of taxable goods or services (IGST,CGST, SGST/ UTGST, cess);
m) Place of supply along with the name of State, in case of supply in the course of inter-state trade or commerce;
n) Address of the delivery where the same is different from the place of supply and
o) Signature or digital signature of the supplier or his authorized representative.

GST invoice shall be prepared in triplicate, in case of supply of goods, in the following manner-

a) The original copy being marked as ORIGINAL FOR RECIPIENT;
b) The duplicate copy being marked as DUPLICATE FOR TRANSPORTER and
c) The triplicate copy being marked as TRIPLICATE FOR SUPPLIER.

In case of any advance given against any supplies contract, the supplier of the goods shall issue Receipt Voucher containing the details of details of advance taken along with particulars as mentioned in clause no. G15. (a), (b), (c), (d), (g), (k), (l), (m) & (o) above.

4.8.9 GENERAL REMARKS ON TAXES & DUTIES:

In view of GST Implementation from 1st July 2017, all taxes and duties including Excise Duty, CST/VAT, Service tax, Entry Tax and other indirect taxes and duties have been submerged in GST. Accordingly reference of Excise Duty, Service Tax, VAT, Sales Tax,

Entry Tax, E1/E2 Forms, and any other form of indirect tax except of GST mentioned in the bidding document shall be ignored.

4.8.10 Oil India Ltd., Rajasthan Project's GST provisional ID No. :08AAACO2352C1ZX

4.9 **INSURANCE**:

4.9.1 The Contractor shall arrange insurance to cover all risks in respect of their personnel, materials and equipment belonging to the Contractor or its subcontractor during the currency of the contract including the third party items/consumables. For materials/equipment belong to the Contractor or its sub-contractor, Contractor may self-insure the same.

4.9.2 Contractor shall at all time during the currency of the contract provide, pay for and maintain the following insurance amongst others:

a) Workmen compensation insurance as required by the laws of the country of origin of the employee.
b) Employer's Liability Insurance as required by law in the country of origin of employee.
c) General Public Liability Insurance or Comprehensive General Liability insurance covering liabilities including contractual liability for bodily injury, including death of persons, and liabilities for damage of property. This insurance must cover all operations of Contractor required to fulfil the provisions under this contract.
d) Contractor's equipment used for execution of the work hereunder shall have an insurance cover with a suitable limit (as per international standards).
e) Automobile Public Liability Insurance covering owned and hired automobiles used in the performance of the work hereunder, with bodily injury limits and property damage limits as governed by Indian Insurance regulations.
f) Public Liability Insurance as required under Public Liability Insurance Act 1991.

4.9.3 Any deductible set forth in any of the above insurance shall be borne by Contractor.

4.9.4 Contractor shall furnish to Company prior to commencement date, certificates of all its insurance policies covering the risks mentioned above.

4.9.5 If any of the above policies expire or are cancelled during the term of this contract and Contractor fails for any reason to renew such policies, then the Company will renew/replace same and charge the cost thereof to Contractor. Should there be a lapse in any insurance required to be carried out by the Contractor for any reason whatsoever, loss/damage claims resulting there from shall be to the sole account of Contractor.

4.9.6 Contractor shall require all of his sub-Contractor to provide such of the foregoing insurance coverage as Contractor is obliged to provide under this Contract and inform the Company about the coverage prior to the commencement of agreements with its sub-Contractors.

4.9.7 All insurance taken out by Contractor shall be endorsed to provide that the underwriters waive their rights of recourse on the Company and to the extent of the liabilities assumed by Contractor under this Contract.

4.9.8 Contractor shall obtain additional insurance or revise the limits of existing insurance as per Company's request in which case additional cost shall be to Contractor's account.

4.10 **CHANGES**:

4.10.1 During the performance of the work, Company may make minor change to take care of any supplementary work within the general scope of this Contract including, but not limited to, changes in methodology, and minor additions to or deletions from the work to be performed. Contractor shall perform the work as changed. Changes of this nature will be affected by written order by the Company.

4.10.2 If any change result in an increase in compensation due to Contractor or in a credit due to Company, Contractor shall submit to Company an estimate of the amount of such compensation or credit in a form prescribed by Company. Such estimates shall be based on the rates shown in the Schedule of Rates (Part-3, Section IV). Upon review of Contractor's estimate, Contractor shall establish and set forth in the Change Order the amount of the compensation or credit for the change or a basis for determining a reasonable compensation or credit for the change. If Contractor disagrees with compensation or credit set forth in the Change Order, Contractor shall nevertheless perform the work as changed, and the parties will resolve the dispute in accordance with Clause 13 hereunder. Contractor's performance of the work as changed will not prejudice Contractor's request for additional compensation for work performed under the Change Order.

4.11 **FORCE MAJEURE** :

4.11.1 In the event of either party being rendered unable by `Force Majeure' to perform any obligation required to be performed by them under the contract, the relative obligation of the party affected by such `Force Majeure' will stand suspended as provided herein. The word `Force Majeure' as employed herein shall mean acts of God, war, revolt, agitation, strikes, riot, fire, flood, sabotage, civil commotion, road barricade (but not due to interference of employment problem of the Contractor) and any other cause, whether of kind herein enumerated or otherwise which are not within the control of the party to the contract and which renders performance of the contract by the said party impossible.

4.11.2 Upon occurrence of such cause and upon its termination, the party alleging that it has been rendered unable as aforesaid thereby, shall notify the other party in writing within Seventy Two (72) hours of the alleged beginning and ending thereof, giving full particulars and satisfactory evidence in support of its claim.

4.11.3 Should `force majeure' condition as stated above occurs and should the same be notified within seventy two (72) hours after its occurrence the `force majeure' rate shall apply for the first 10(ten) days. Either party will have the right to terminate the Contract if such `force majeure' conditions continue beyond 10 (ten) days with prior written notice. Should either party decide not to terminate the Contract even under such condition, no payment would apply after expiry of ten-(10) day’s force majeure period unless otherwise agreed to.

4.12 **TERMINATION**:

4.12.1 **TERMINATION ON EXPIRY OF THE TERMS (DURATION):** This contract shall be deemed to have been automatically terminated on the expiry of duration of the contract, thereof.

4.12.2 **TERMINATION ON ACCOUNT OF FORCE MAJEURE**: Either party shall have the right to terminate this Contract on account of Force Majeure as set forth in Article 4.11 above.

4.12.3 **TERMINATION ON ACCOUNT OF INSOLVENCY:** In the event that the Contractor or its collaborator at any time during the term of the Contract, becomes insolvent or makes a voluntary assignment of its assets for the benefit of creditors or is adjudged bankrupt, then the Company shall, by a notice in writing have the right to terminate the Contract and all the Contractor's rights and privileges hereunder, shall stand terminated forthwith.

4.12.4 **TERMINATION FOR UNSATISFACTORY PERFORMANCE**: If the Company considers that, the performance of the Contractor is unsatisfactory, or not upto the expected standard, the Company shall notify the Contractor in writing and specify in details the cause of the dissatisfaction. The Company shall have the option to terminate the Contract by giving 15 days notice in writing to the Contractor, if Contractor fails to comply with the requisitions contained in the said written notice issued by the Company.

4.12.5 **TERMINATION DUE TO CHANGE OF OWNERSHIP & ASSIGNMENT**: In case the Contractor's rights and /or obligations under this Contract and/or the Contractor's rights, title and interest to the equipment/ material, are transferred or assigned without the Company's consent, the Company may at its absolute discretion, terminate this Contract.

4.12.6 **TERMINATION DUE TO NON-AVAILABILITY OF PERSONNEL**: If at any time during the term of this Contract, Contractor being unable to perform their obligations hereunder for a period of 15 successive days, Company at its option, may terminate this Contract in its entirely without any further right or obligation on the part of the Company, except for the payment of money then due. No notice shall be served by the Company under the condition stated above.

Notwithstanding any provisions herein to the contrary, the Contract may be terminated at any time by the company on giving 15 (fifteen) days written notice to the Contractor due to any other reason not covered under the above clause from 12.1 to 12.6 and in the event of such termination the Company shall not be liable to pay any cost or damage to the Contractor except for payment of services as per the Contract up to the date of termination.

4.12.7 **CONSEQUENCES OF TERMINATION**: In all cases of termination herein set forth, the relative obligations of the parties to the Contract shall be limited to the period up to the date of termination. Notwithstanding the termination of this Contract, the parties shall continue to be bound by the provisions of this Contract that reasonably require some action or forbearance after such termination.

4.12.8 Upon termination of this Contract, Contractor shall return to Company all of Company's items, which are at the time in Contractor's possession.

4.12.9 In the event of termination of contract, Company will issue Notice of termination of the contract with date or event after which the contract will be terminated. The contract shall then stand terminated and the Contractor shall demobilize their personnel & materials.

4.13 **SETTLEMENT OF DISPUTES AND ARBITRATION**:

4.13.1 **Arbitration (Applicable for Suppliers/Contractors other than PSU):**

Except as otherwise provided elsewhere in the contract, if any dispute, difference, question or disagreement arises between the parties hereto or their respective representatives or assignees, in connection with construction, meaning, operation, effect, interpretation of the contract or breach thereof which parties are unable to settle mutually, the same shall be referred to Arbitration as provided hereunder:

1. A party wishing to commence arbitration proceeding shall invoke Arbitration Clause by giving 30 days notice to the other party. The notice invoking arbitration shall specify all the points of dispute with details of the amount claimed to be referred to arbitration at the time of invocation of arbitration and not thereafter. If the claim is in foreign currency, the claimant shall indicate its value in Indian Rupee for the purpose of constitution of the arbitral tribunal.

2. The number of arbitrators and the appointing authority will be as under:

Claim amount (excluding claim for interest and counter claim, if any)	**Number of Arbitrator**	**Appointing Authority**
Upto INR 5 Crore	Sole Arbitrator	OIL
Above INR 5 Crore	3 Arbitrators	One Arbitrator by each party and the 3rd Arbitrator, who shall be the presiding Arbitrator, by the two Arbitrators.

3. The parties agree that they shall appoint only those persons as arbitrators who accept the conditions of the arbitration clause. No person shall be appointed as Arbitrator or Presiding Arbitrator who does not accept the conditions of the arbitration clause.

4. Parties agree that there will be no objection if the Arbitrator appointed holds equity shares of OIL and/or is a retired officer of OIL/any PSU. However, neither party shall appoint its serving employees as arbitrator.

5. If any of the Arbitrators so appointed dies, resigns, becomes incapacitated or withdraws for any reason from the proceedings, it shall be lawful for the concerned party/arbitrators to appoint another person in his place in the same manner as aforesaid. Such person shall proceed with the reference from the stage where his predecessor had left if both parties consent for the same ; otherwise, he shall proceed de novo.

6. Parties agree that neither shall be entitled for any pre-reference or pendente-lite interest on its claims. Parties agree that any claim for such interest made by any party shall be void.

7. The arbitral tribunal shall make and publish the award within time stipulated as under:

Amount of Claims and counter claims(excluding interest)	Period for making and publishing of the award(counted from the date of first meeting of the Arbitrators)
Upto INR 5 Crore	Within 8 months

Above INR 5 Crore	Within 12 months

The above time limit can be extended by Arbitrator, for reasons to be recorded in writing, with the consent of the other parties.

8. If after commencement of the arbitration proceedings, the parties agree to settle the dispute mutually or refer the dispute to conciliation, the arbitrators shall put the proceedings in abeyance until such period as requested by the parties.

9. Each party shall be responsible to make arrangements for the travel and stay etc. of the arbitrator pointed by it. Claimant shall also be responsible for making arrangements for travel/stay arrangements of the Presiding Arbitrator and the expenses incurred shall be shared equally by the parties.

   In case of sole arbitrator, OIL shall make all necessary arrangements for his travel, stay and the expenses incurred shall be shared equally by the parties.

10. The Arbitration shall be held at the place from where the contract has been awarded. However, parties to the contract can agree for a different place for the convenience of all concerned.

11. The Arbitrator(s) shall give reasoned and speaking award and it shall be final and binding on the parties.

12. Subject to aforesaid, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof shall apply to the arbitration proceedings under this clause.

4.13.2 **Arbitration (applicable in case of Contract awarded on Public Sector Enterprise)**:

In the event of any dispute or difference relating to, arising from or connected with the Contract, such dispute or difference shall be referred by either party to the arbitration of one of the Arbitrators in the Department of Public Enterprises, to be nominated by the Secretary to the Government of India, In-Charge of the Bureau of Public Enterprises. The Arbitration and Conciliation Act 1996 shall not be applicable to the Arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Deptt. of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference, the dispute shall be decided by the Law Secretary or the Special Secretary/Additional Secretary, whose decision shall bind the parties finally and conclusively. The parties in the dispute will share equally the cost of the arbitration as intimated by the Arbitrator.
The venue of all arbitrations under both 4.13.1 & 4.13.2 will be Jodhpur, Rajasthan. The award made in pursuance thereof shall be binding on the parties.

4.14 **NOTICES**:

4.14.1 Any notice given by one party to other, pursuant to this Contract shall be sent in writing or by telex or Fax and confirmed in writing to the applicable address specified below:

a) **Company**

OIL INDIA LIMITED

b) **Contractor**

_____

2- A, DISTRICT SHOPPING CENTRE
SARASWATI NAGAR, BASNI,
JODHPUR-342005, RAJASTHAN
Fax No. 0291- 2727050

_____
Fax No. :

4.14.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

4.15 **SUBCONTRACTING/ASSIGNMENT**: Contractor shall not subcontract, transfer or assign the contract, in full or any part under this contract, to any third party. Except for the main services under this contract, Contractor may sub-contract the petty support services subject to Company's prior approval. However, Contractor shall be fully responsible for complete execution and performance of the services under the Contract.

4.16 **MISCELLANEOUS PROVISIONS**:

4.16.1 Contractor shall give notices and pay all fees at their own cost required to be given or paid by any National or State Statute, Ordinance, or other Law or any regulation, or bye-law of any local or other duly constituted authority as may be in force from time to time in India, in relation to the performance of the services and by the rules & regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the services.

4.16.2 Contractor shall conform in all respects with the provisions of any Statute, Ordinance of Law as aforesaid and the regulations or bye-law of any local or other duly constituted authority which may be applicable to the services and with such rules and regulation public bodies and Companies as aforesaid and shall keep Company indemnified against all penalties and liability of every kind for breach of any such Statute, Ordinance or Law, regulation or bye-law.

4.16.3 During the tenure of the Contract, Contractor shall keep the site where the services are being performed reasonably free from all unnecessary obstruction and shall store or dispose of any equipment and surplus materials and clear away and remove from the site any wreckage, rubbish or temporary works no longer required. On the completion of the services, Contractor shall clear away and remove from the site any surplus materials, rubbish or temporary works of every kind and leave the whole of the site clean and in workmanlike condition to the satisfaction of the Company.

4.16.4 The personnel deployed under this contract cannot be changed during the tenure of the Contract except due to sickness/death/resignation of the personnel in which case the replaced person should have equal experience and qualification, which will be again subject to approval, by the Company.

4.17 **LIQUIDATED DAMAGES FOR DEFAULT IN TIMELY MOBILIZATION**:

4.17.1 Time is the essence of this Contract. In the event of the Contractor's default in timely initial mobilization for commencement of operations within the stipulated period, the Contractor shall be liable to pay liquidated damages @ 1/2% of contract value including mobilization cost, per week or part thereof of delay subject to maximum of 7.5%. Liquidated Damages will be reckoned from the expiry date of the scheduled mobilization period as defined in para 4.2.2 above.

4.17.2 For the default in subsequent mobilization the Contractor shall be liable to pay liquidated damages @ 1/2% of total monthly rate calculated for a period of twelve (12) months for the failure of particular personnel / personnel(s), per week or part thereof of delay subject to maximum of 7.5%. Liquidated Damages will be reckoned from the expiry date of the scheduled mobilization period as defined in para 4.2.2 above.

4.17.3 An amount equivalent to INR 2,000/- per man day X the number of manpower unavailable at office / site shall be recovered from the monthly invoice in addition to the non-payment of man-day charges due to the unavailability of the manpower at the office / worksite on working days.

4.17.4 If the Contractor fails to mobilize within 120 days after the stipulated date, then the Company reserves the right to cancel the Contract without any compensation whatsoever.

4.17.5 The parties agree that the sum specified above is not a penalty but a genuine pre-estimate of the loss/damage which will be suffered by OIL on account of delay/breach on the part of the Contractor and the said amount will be payable without proof of actual loss or damage caused by such delay/breach and without any demur and shall not be open for any dispute whatsoever.

4.18 **ASSOCIATION OF COMPANY'S PERSONNEL**: Company's officer may be associated with the work throughout the service. The Contractor personnel shall execute the assigned services with professional competence and in an efficient and workman like manner and provide Company with a standard of work customarily provided by reputed Contractors to major international oil companies in the petroleum industry.

4.19 **LABOUR:** The recruitment of the labour shall be met from the areas of operation and wages will be according to the rates prevalent at the time which can be obtained from the District Authorities of the area. The facilities to be given to the labourers should conform to the provisions of labour laws as per contract Labour (Regulation and Abolition) Act, 1970.

4.20 **LIABILITY**:

4.20.1 Except as otherwise expressly provided, neither Company nor its servants, agents, nominees, Contractors, or sub-contractors shall have any liability or responsibility whatsoever to whomsoever for loss of or damage to the equipment and/or loss of or damage to the property of the Contractor and/or their Contractors or sub-contractors, irrespective of how such loss or damage is caused and even if caused by the negligence of Company and/or its servants, agent, nominees, assignees, contractors and sub-Contractors. The Contractor shall protect, defend, indemnify and hold harmless Company from and against such loss or damage and any suit, claim or expense resulting there from.

4.20.2 Neither Company nor its servants, agents, nominees, assignees, Contractors, sub-contractors shall have any liability or responsibility whatsoever for injury to, illness, or death of any employee of the Contractor and/or of its Contractors or sub-contractor irrespective of how such injury, illness or death is caused and even if caused by the negligence of Company and/or its servants, agents nominees, assignees, Contractors and sub-contractors. Contractor shall protect, defend, indemnify and hold harmless Company from and against such liabilities and any suit, claim or expense resulting there from.

4.20.3 The Contractor hereby agrees to waive its right of recourse and further agrees to cause its underwriters to waive their right of subrogation against Company and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for loss or damage to the equipment of the Contractor and/or its sub-contractors and/or their employees when such loss or damage or liabilities arises out of or in connection with the performance of the contract limited to the Contractor's liabilities agreed to under this Contract.

4.20.4 The Contractor hereby further agrees to waive its right of recourse and agrees to cause its underwriters to waive their right of subrogation against Company and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for injury to, illness or death of any employee of the Contractor and of its contractors, sub-contractors and/or their employees when such injury, illness or death arises out of or in connection with the performance of the contract limited to the Contractor's liabilities agreed to under this Contract.

4.20.5 Except as otherwise expressly provided, neither Contractor nor its servants, agents, nominees, Contractors or sub-contractors shall have any liability or responsibility whatsoever to whomsoever for loss of or damage to the equipment and/or loss or damage to the property of the Company and/or their Contractors or sub-contractors, irrespective of how such loss or damage is caused and even if caused by the negligence of Contractor and/or its servants, agents, nominees, assignees, Contractors and sub-contractors. The Company shall protect, defend, indemnify and hold harmless Contractor from and against such loss or damage and any suit, claim or expense resulting there from.

4.20.6 Neither Contractor nor its servants, agents, nominees, assignees, Contractors, sub-contractors shall have any liability or responsibility whatsoever to whomsoever for injury or illness, or death of any employee of the Company and/or of its Contractors or sub-contractors irrespective of how such injury, illness or death is caused and even if caused by the negligence of Contractor and/or its servants, agents, nominees, assignees, Contractors and sub-contractors. Company shall protect, defend indemnify and hold harmless Contractor from and against such liabilities and any suit, claim or expense resulting there from.

4.20.7 The Company agrees to waive its right of recourse and further agrees to cause its underwriters to waive their right of subrogation against Contractor and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for loss or damage to the equipment of Company and/or its contractors or sub-contractors when such loss or damage or liabilities arises out of or in connection with the performance of the contract.

4.20.8 The Company hereby further agrees to waive its right of recourse and agrees to cause it underwriters to waive their right of subrogation against Contractor and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for injury to, illness or death of any employee of the Company and of its Contractors, sub-contractors and/or their employees when such injury, illness or death arises out of or in connection with the performance of the Contract.

4.21 **LIMITATION OF LIABILITY**: Notwithstanding any other provisions herein to the contrary, except only in cases of wilful misconduct and / or criminal acts,

(a) Neither the Contractor nor the Company (OIL) shall be liable to the other, whether in Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs.

(b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under Contract, in tort or otherwise, shall not exceed 50% of the Annualized Contract Price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Contractor, or to any obligation of the Contractor to indemnify the Company with respect to Intellectual Property Rights.

(c) Company shall indemnify and keep indemnified Contractor harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above.

4.22 **INDEMNITY AGREEMENT**:

4.22.1 Except as provided hereof Contractor agrees to protect, defend, indemnify and hold Company harmless from and against all claims, suits, demands and causes of action, liabilities, expenses, cost, liens and judgments of every kind and character, without limit, which may arise in favour of Contractor's employees, agents, contractors and sub-contractors or their employees on account of bodily injury or death, or damage to personnel/properly as a result of the operations contemplated hereby, regardless of whether or not said claims, demands or causes of action arise out of the negligence or otherwise, in whole or in part or other faults.

4.22.2 Except as provided hereof Company agrees to protect, defend, indemnify and hold Contractor harmless from and against all claims, suits, demands and causes of action, liabilities, expenses, cost, liens and judgments of every kind and character, without limit, which may arise in favour of Company's employees, agents, contractors and sub-contractors or their employees on account of bodily injury or death, or damage to personnel/properly as a result of the operations contemplated hereby, regardless of whether or not said claims, demands or causes of action arise out of the negligence or otherwise, in whole or in part or other faults.

4.23 **INDEMNITY APPLICATION**: The indemnities given herein above, whether given by Company or Contractor shall be without regard to fault or to the negligence of either party even though said loss, damage, liability, claim, demand, expense, cost or cause of action may be caused, occasioned by or contributed to by the negligence, either sole or concurrent of either party.

4.23.1 The Contractor shall not make Company liable to reimburse the Contractor to the statutory increase in the wage rates of the contract labour appointed by the Contractor. Such statutory or any other increase in the wage rates of the contract labour shall be borne by the Contractor.

4.23.2 The Contractor shall not engage labour below 18 (eighteen) years of age under any circumstances. Persons above 60 (sixty) years age also shall not be deployed except Manager / Superintendent.

4.23.3 Moreover, the Contractor should obtain and produce in advance to commencement of Work the following certificate / approvals:

(i) Total manpower list.

(ii) License/certificate from specified electrical authorities for the rig and camp electrical personnel, if required.
(iii) All certificates as per applicable laws.
(iv) Regional Labour certificate, if required..

4.24 **ENTIRE CONTRACT**: This Contract contains the entire agreement between the Parties and supersedes any previous understandings, commitments, agreements or representations whatsoever, oral or written, pertaining to the subject matter hereof, provided that nothing in this Clause (Entire Contract) shall have effect to exclude or restrict the liability of either Party for fraud or fraudulent misrepresentation.

4.25 **RECORDS, REPORTS AND INSPECTION**: The Contractor shall, at all times, permit the Company and its authorized employees and representatives to inspect all the Work performed and to witness and check all the measurements and tests made in connection with the said work. The Contractor shall keep an authentic, accurate history and logs including safety records of each IP survey section with major items consumed, which shall be open at all reasonable times for inspection by the Company designated representatives and its authorized employees and representatives. The Contractor shall provide the Company designated representatives with a daily written report, on form prescribed by the Company showing details of operations during the preceding 24 hours and any other information related to the said IP survey requested by the Company whenever so requested. The Contractor shall not, without Company's written consent allow any third person(s) access to the said survey, or give out to any third person information in connection therewith.

4.26 **INSPECTION OF MATERIALS:**

4.26.1 INSPECTION BY CONTRACTOR: The Contractor agrees to perform a visual inspection, using its personnel, of all materials and appliances furnished by the Company when delivered into Contractor's possession and shall notify Company's representative of any apparent defects observed therein so that Company may replace such defective materials or appliances. If Contractor fails to notify the Company of any apparent defects as provided above, it shall be conclusively presumed that such materials and appliances are free from such apparent defect. Contractor shall not be liable for any loss or damage resulting from the use of materials or appliances furnished by the Company containing latent defects. Upon the termination of this Agreement, Contractor shall return to the Company at the site all machinery, equipment, tools, spare parts and supplies received by Contractor from the Company or purchased by the Contractor for the Company's account and not used or consumed in the operations, in as good condition as when received by Contractor, normal wear & tear excepted. If damage to any of the Company's equipment is caused due to sole negligence of the Contractor, same will be repaired or replaced at Contractor's cost. Contractor shall, if requested by the Company also maintain or repair, at its cost, any of the Company's items, at the site which Contractor is qualified to and can maintain or repair with Contractor's normal complement of personnel and the equipment at the site provided however that the Company shall at its cost provide all spare parts and materials required to maintain or repair the Company's items. However, it shall remain the Company's basic responsibility and liability to ensure that such items are always in good workable condition.

4.26.2 INSPECTION BY OPERATOR: The Company shall have the right to inspect and reject for any valid cause any items furnished by Contractor and Contractor shall replace or repair at its sole expense such items so rejected with items free of defects, to the satisfaction of the Company.

4.27 **ROYALITY AND PATENTS**: Each party shall hold harmless and indemnify the other from and against all claim and proceedings for or on account of any patent rights, design, trade mark or other protected rights arising from any use of materials, equipment, processes, inventions and methods which have not been imposed on the attending party by the terms of the contract or the specifications or drawings forming part thereof.

4.28 **CUSTOMS DUTY** : All imports and import clearances under the contract shall be done by the contractor and OIL shall not provide any assistance in this regard. Contractor shall, however, arrange clearance of such items from Customs and port authorities in India and shall pay all requisite demurrages, if any, clearance fees/charges, port fees, clearing and forwarding agent fees/ charges, inland transport charges etc. Company shall provide all assistance by issuance of necessary letter of authority or other relevant documents and necessary help.

4.29 **DEMOBILIZATION & RE-EXPORT** : Deleted.

4.30 **PAYMENTS, MANNER OF PAYMENT, RATES OF PAYMENT:**

4.30.1 Company shall pay to the Contractor during the term of the Contract the amount due from time to time calculated according to the rates of payment set and in accordance with other provisions hereof. No. other payments shall be due from company unless specifically provided for in the Contract. All payments will be made in accordance with the terms hereinafter described.

4.30.2 **MANNER OF PAYMENT:** All payments due by company to Contractor hereunder shall be made at Contractor's project specific bank account opened by the Contractor as per clause no. 5.0 (ii) under B. Financial Criteria of SECTION-III. Bank charges, if any will be on account of the Contractor.

4.30.3 Payment of any invoices shall not prejudice the right of company to question the validity of any charges therein, provided company within one year after the date of payment shall make and deliver to contractor written notice of objection to any item or items the validity of which Company questions.

4.31 **INVOICES:**

4.31.1 Contractor shall send invoice to company on the day following the end of each month for all daily or monthly charges due to the contractor.

4.31.2 Contractor will submit 04 (Four) sets of all invoices duly super scribed 'Original' and 'copy' as applicable to the company for processing payment. Separate invoices for the charges payable under the contract shall be submitted by the Contractor for foreign currency and Indian currency.

4.31.3 Payment of monthly invoices, if undisputed, shall be made within 30 days following the date of receipt of invoice by Company.

4.31.4 Company shall within 30 days of receipt of the invoice notify the contractor of any item under dispute, specifying the reasons thereof, in which event, payment of the disputed amount may be withheld until settlement of the dispute, but payment shall be made of any undisputed portion on or before the due date. This will not prejudice the company's

right to question the validity of the payment at a later date as envisaged in Clause 31.3 above.

4.31.5 The acceptance by Contractor of part payment on any billing not paid on or before the due date shall not be deemed a waiver of Contractor's rights in any other billing, the payment of which may then or thereafter be due.

4.31.6 Payment of Final demobilization charges shall be made if applicable within 45 days on receipt of invoice by Company accompanied by the following documents from the Contractor:

a) Audited account up to completion of the Contract.
b) Tax audit report for the above period as required under the Indian Tax Laws.
c) Documentary evidence regarding the submission of returns and payment to taxes for the expatriate personnel engaged by the Contractor or by its sub-contractor.
d) Any other documents as required by applicable Indian Laws.

In case, no demobilization charges are payable, the documents mentioned above will have to be submitted by the Contractor before release of the final payment by the Company. A certificate from Chartered Accountant on (a), (b) & (c) above will suffice.

4.31.7 Contractor shall maintain complete and correct records of all information on which contractor's invoice are based up to 2 (two) years from the date of last invoice. Such records shall be required for making appropriate adjustments or payments by either party in case of subsequent audit query / objection.

4.32 **APPLICABLE LAW**:

4.32.1 The Contract shall be deemed to be a Contract made under, governed by and construed in accordance with the laws of India for the time being in force and shall be subject to the exclusive jurisdiction of Courts situated in Jodhpur, Rajasthan.

4.32.2 The Contractor shall ensure full compliance of various Indian Laws and Statutory Regulations, to the extent applicable, as stated below, but not limited to, in force from time to time and obtain necessary permits / licenses etc. from appropriate authorities for conducting operations under the Contract:

a) Income Tax Act. & Sales Tax Act.
b) The Minimum Wages Act, 1948
c) Insurance Act
d) The Workmen's Compensation Act, 1923
e) The Payment of Wages Act, 1963
f) The Payment of Bonus Act, 1965
g) The Contract Labour (Regulation & Abolition) Act, 1970 and the rules framed there under
h) The Employees Pension Scheme, 1995
i) The Interstate Migrant Workmen Act., 1979 (Regulation of employment and conditions of service)
j) The Employees Provident Fund and Miscellaneous Provisions Act, 1952
k) The Rajasthan Tax Act
l) GST Act.
m) Customs & Excise Act & Rules
n) Taxation Acts for the State of Gujarat
o) HSE Guidelines
p) Related Acts referred in any other part of the tender document.

4.32.3 **EXPATRIATE PERSONNEL**: If any expatriate personnel are engaged by the Contractor to perform the services required under the contract, securing permission from the Ministry of External Affairs (MEA), Ministry of Home Affairs (MOHA), Ministry of Defence (MOD) Govt. Of India and Local Authorities on time shall rest on the Contractor. OIL will only assist the Contractor by providing introductory letter / recommendatory letter required, if any, for securing the above permissions.

4.32.4 **SUBSEQUENTLY ENACTED LAWS**: Subsequent to the date of bid closing, if there is a change in or enactment of any law or change in application or enforcement or interpretation of existing law by any governmental authority or public body, which results in addition/ reduction in cost to Contractor on account of the operation contemplated under the Contract, the Company/Contractor shall reimburse the Contractor/pay Company for such additional/reduced costs actually incurred/saved by Contractor, subject to the submission of documentary evidence by Contractor/Company.

4.32.5 **SET-OFF**: Any sum of money due and payable to the Contractor (including Performance Security refundable to them) under this or any other Contract may be appropriated by OIL and set-off against any claim of OIL (or such other person or persons contracting through OIL) for payment of a sum of money arising out of this contract or under any other contract made by the Contractor with OIL (or such other person or persons contracting through OIL).

4.32.6 **WITHHOLDING**: Company may withhold or nullify the whole or any part of the amount due to Contractor, after informing the Contractor of the reasons in writing, on account of subsequently discovered evidence in order to protect Company from loss on account of:

a) For non-completion of jobs assigned as per Sections-V to X.
b) Contractor's indebtedness arising out of execution of this Contract.
c) Defective work not remedied by Contractor.
d) Claims by sub-Contractor of Contractor or others filed or on the basis of reasonable evidence indicating probable filing of such claims against Contractor.
e) Failure of Contractor to pay or provide for the payment of salaries/ wages, contributions, unemployment compensation, taxes or enforced savings with-held from wages etc.
f) Failure of Contractor to pay the cost of removal of unnecessary debris, materials, tools, or machinery.
g) Damage to another Contractor of Company.
h) All claims against Contractor for damages and injuries, and/or for non-payment of bills etc.
i) Any failure by Contractor to fully reimburse Company under any of the indemnification provisions of this Contract. If, during the progress of the work Contractor shall allow any indebtedness to accrue for which Company, under any circumstances in the opinion of Company may be primarily or contingently liable or ultimately responsible and Contractor shall, within five days after demand is made by Company, fail to pay and discharge such indebtedness, then Company may during the period for which such indebtedness shall remain unpaid, with-hold from the amounts due to Contractor, a sum equal to the amount of such unpaid indebtedness.

Withholding will also be effected on account of the following:

i) Order issued by a Court of Law in India.
ii) Income-tax deductible at source according to law prevalent from time to time in

the country.

iii) Any obligation of Contractor which by any law prevalent from time to time to be discharged by Company in the event of Contractor's failure to adhere to such laws.

iv) Any payment due from Contractor in respect of unauthorized imports.

When all the above grounds for withholding payments shall be removed, payment shall thereafter be made for amounts so with-hold.

Notwithstanding the foregoing, the right of Company to withhold shall be limited to damages, claims and failure on the part of Contractor, which is directly/indirectly related to some negligent act or omission on the part of Contractor.

4.32.7 **WAIVER**: Any delay in exercising and any omission to exercise any right, power or remedy exercisable by the Company under this contract shall not impair such right, power or remedy nor shall any waiver by the Company of any breach by the Contractor of any provision of this contract prevent the subsequent enforcement of that provision by the Company or be deemed a waiver by the Company of any subsequent breach by the Contractor.

4.32.8 **CONSEQUENTIAL DAMAGE**: Except as otherwise expressly provided, neither party shall be liable to the other for special, indirect or consequential damages resulting from or arising out of the contract, including but without limitation, to loss or profit or business interruptions, howsoever caused and regardless of whether such loss or damage was caused by the negligence (either sole or concurrent) of either party, its employees, agents or sub-contractors.

4.33 **INGRESS AND EGRESS AT LOCATION:**

4.33.1 The Company shall provide the Contractor, if required, requisite certificates for obtaining rights of ingress to, egress from locations where jobs are to be performed, including any certificates required for permits or licenses for the movement of the Contractor's personnel. Should such permits/licenses be delayed because of objections of concerned authorities in respect of specific Contractor's person(s), such person (s) should be promptly removed from the list by the Contractor and replaced with acceptable person (s).

4.34 **RIGHTS OF OWNER:**

4.34.1 Bidders are informed that Owner is neither under any obligation to select any bidder nor to assign any reason for either qualifying or disqualifying any bidder. Owner is also not under any obligation to proceed with the project or any part thereof.

4.34.2 At any time prior to opening of price proposals, either on its own initiative or in response to clarifications requested by any prospective bidder, Owner may modify the document by issuing an amendment by courier/fax / e-mail, etc. to all bidders.

4.34.3 Owner reserves the right to reject any or all proposals without assigning any reason thereto.

4.35 **GENERAL HSE GUIDELINES:** As per Annexure –XIII.

END OF SECTION-IV

SECTION–V

SPECIAL CONDITIONS OF CONTRACT

FOR

SUPPLY, ERECTION & COMMISSIONING

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SECTION–V

SPECIAL CONDITIONS OF CONTRACT FOR SUPPLY, ERECTION & COMMISSIONING

A. COMMON FOR COMPLETE HYBRID PROJECT

5.1 DEFINITIONS & INTERPITATION

Acts/Codes shall mean, but not limited to the following, including the latest amendments, and/or replacements, if any: -

1. Electricity Act, 2003 with amendments thereto, if any.
2. A.I.E.E Test Codes
3. American Society of Testing of Materials (ASTM Codes).
4. Relevant standards of the Bureau of Indian Standards (IS Codes)
5. Arbitration and Conciliation Act, 1996, and Rules made there under.
6. Environment (Protection) Act, 1986 and Rules made there under.
7. Other approved standards and/or Rules and Regulations touching the subject matter of the Contract.

Applicable Laws means any statute, law, regulation, ordinance, rule, judgment, order, decree, restriction, directive, governmental authorizations, requirements of Applicable Permits and any agreements, decisions, acts, instructions, requirements, directions and notifications of the competent authority having jurisdiction over the matter in question, whether in effect as on bid closing Date and Time..

ABT Meter means meter for measurement power and energy as per **IEGC**

Bid and Bid Document shall mean the proposal submitted by the Bidder in response to this ITB in accordance with the terms and conditions hereof.

Bidder shall mean the Bidding Entity or the Bidding Consortium which has submitted a proposal, in response to this ITB to Owner.

Bidding Entity shall mean a single entity or consortium, whether a firm or a Company.

BIS shall mean Bureau of Indian Standards.

Bidding Consortium shall mean a consortium of entities, being firms, companies or Governmental entities, which have submitted a proposal in response to this ITB**.**

Time Schedule shall mean the period by which the work shall be completed as agreed herein between the Owner and the Contractor as per clause no.5.10

Company shall mean a body incorporated in India under the Companies Act, 1956/2013

Completion Certificate shall mean as defined in 5.27 of this Section.

Commissioning of Project shall mean the commissioning of complete hybrid project consists of 41 MW (±5%) Wind Power Project and 14 MW of Solar power including its interfacing with State Grid and commencement of export of electrical energy to the grid

Date of Commissioning of wind energy generator shall mean the date of commissioning mentioned in the certificate issued by REMCL on successful commissioning of wind and solar power project as the case may be.

Contractor means the person or the persons, firm or Company or corporation whose tender has been accepted by the Employer and includes the Contractor's legal Representatives, his successors and permitted assigns.

CT means current transformer meant for measurement of current

C&R Panel means relay & control panel

CEIG means Chief Electrical Inspector of State Government

CRM means customer relations manager

CAPEX Total capital cost of hybrid project excluding annual Operation & Maintenance charges

Common Facilities As defined at clause number 5.21

DISCOM means 'Concerned Distribution Utility of the State'.

DSM means deviation settlement mechanism

Date of completion means the date of issue of completion

Effective Date/Zero Date shall mean the date of issue of Fax/ Letter of Intent

Engineering, Procurement and Construction Contractor (EPC) shall mean the firm/company or party on whom the Letter of Intent/Work Order for faithful execution of the work mentioned herein is placed and shall include his/her/their heirs, legal representatives and successors and permitted assigns.

Final Acceptance shall mean completion of project activities in all respect including 96 Hrs test run & Power curve performance test or any other test required as per contract

Facility means land, wind turbine, generator, Solar Modules, Inverter / cables, step up sub-station, power evacuation system including Pooling substation and EHV line up to metering point.

GEDA means Gujarat Energy Development Agency

GETCO means Gujarat Energy Transmission Corporation Limited

GHI means Global Horizontal Irradiation

Hybrid means Wind energy Project of 41 (±5%) MW capacity & solar energy Project of 14 MW capacity connected to common pooling station.

Inter-connection Point shall mean a point at EHV substation of transmission licensee or HV substation of distribution licensee, as case may be, where the electricity produced from the RE generating station is injected into state Grid.

Inverter / PCU means device for conversion of direct current to alternating current

Irradiation means solar insolation (GHI)

KW/MW means Kilo Watt/Mega Watt

KWh means Kilowatt Hours

LCS means local control system.

LID Light Induced Degradation

Micro-siting means identification of points on the offered land contours based upon wind resource assessment, where individual WEG is to be located in the wind farm. These locations (points) for the WEGs shall be optimized to have maximum possible electricity generation.

Metering Point means the point at which the State Power Utility / Electricity Board measures the quantity of energy supplied to its grid.

Machine Availability means the period for which the WEG is in the state of power generation and remains available in healthy condition irrespective of wind condition. Formula of Machine Availability is defined at Clause 6.20.

MBD means Machine Break Down for insurance purpose.

MNRE means 'Ministry of New & Renewable Energy Sources, Government of India'.

Nacelle Assembly means set of generating equipment consisting of Gear Box and generator.

NEEGG means Net Electrical Energy Generation Guarantee for a year is calculated by using the Net Electrical Energy Generation Guarantee (NEEGG) quoted in the Bid offer by the Contractor adjusted with a correction factor to take into account the actual average global solar radiation measured by the calibrated pyrometer for that year.

NIWE means National Institute of Wind Energy (Erstwhile known as Center for Wind Energy Technology) Chennai.

NODAL AGENCY means 'Renewable Energy Corporation/Agency of the State'.

Nominal Output Annual Means Annual incident solar irradiation at the generator surface of the PV plant x relative efficiency of the PV plant modules

OAT shall mean Operational Acceptance Test for Solar Project

O&M shall mean Operation & Maintenance of hybrid power project which inter alia, includes provisions of manpower, spares, special tools, cranes or such materials/equipment that may be required for maintaining the WEGs and solar system in operation.

Operator shall mean the person or the persons, firm or Company or corporation whose tender has been accepted for operation & maintenance by the Owner and includes the Contractor's legal Representatives, his successors and permitted assigns.

Project shall mean the Development, Design, Engineering, Supply, Procurement and Construction, Commissioning, Operation and Maintenance of the proposed Wind energy Project of 41 (±5%) MW capacity & solar energy Project of 14 MW capacity connected to common pooling station.

Project Life means the operational life of Hybrid project and all associated equipment and the same shall not be less than 25 years.

PT means potential transformer meant for measurement of voltage.

PPA/EPA shall mean Power Purchase Agreement/Energy Purchase Agreement

Prudent Utility Practice means accepted international/Indian practice(s), standard(s), engineering and operation considerations, taking into account the conditions prevalent at Site including manufacturer's recommendations generally followed in the operation and maintenance of facilities similar to the power plant

Power Curve is a curve drawn with wind velocity in meter per second as axis and the corresponding energy generated by WEG as ordinate at standard density of air. (1.225kg/m³)

PR "Performance Ratio" (PR) means the ratio of actual plant output versus Calculated, nominal plant output in kWh annual.

PGT means Performance Ratio Guarantee Test

QCA means Qualified Coordinating Agency

Reactive Power shall mean the Reactive Power drawn from the grid and charged by the power utility from the Owner and measured in KVARh.

REMCL shall mean Railway Energy Management Company limited

SEB shall mean State Electricity Board.

Stabilization Period means time required for fine tuning of the WEG and is considered as 60 Days from the date of commissioning as per clause no.5.25 / 5.34 as applicable.

SMB means String Monitoring Box

TRANSCO means ‘State Transmission Company or Corporation’

Tier one shall mean list of manufactures declared/announced by Bloomberg or equivalent third party.

VAR means reactive power.

VCB means Vacuum Circuit Breaker

WAsP means Wind Atlas Analysis and Application Program.

WEG shall mean Wind Electric Generator.

OPEX Total Operation & maintenance cost of project for 25 Years.

5.2 GENERAL

5.2.1 Special Conditions of Contract shall be read in conjunction with the General Conditions of Contract, Scope of work, Technical specifications, drawings and any other document forming part of this contract, wherever the context so requires.

5.2.2 Where any portion of the Special Conditions of Contract (SCC) is repugnant to or at variance with any provisions of the General Conditions of Contract (GCC), the provision of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract.

The materials, design and workmanship shall satisfy the applicable standards, specifications contained herein and codes referred to. Where the Technical Specifications stipulate requirements in addition to those contained in the standard codes and specifications, those additional requirements shall be satisfied.

In case of any contradiction in any of the terms & conditions to the extent that the two provisions cannot co-exist, the following shall prevail in order of precedence.

i) Contract Agreement
ii) Work Order
iii) Letter/ Fax of Intent
iv) Statement of Agreed Variations
v) Instructions to Bidder
vi) Special Conditions of Contract
vii) Scope of Work
viii) Technical Specifications.
ix) General Conditions of Contract.
x) Any other document

5.2.3 Environmental Laws

All applicable codes, laws, rules and regulations relating to actual or potential effect of the activities on and at the project contemplated by executing this project on the environment, the disposal of material, the discharge of chemicals, gases or other substances or materials into the environment, or the presence of such materials, chemicals, gases or other substances in or on the project.

5.3 POWER PLANT

The complete, fully functional and operational hybrid power generating station including related facilities, substation and controls necessary to enable the plant to deliver electric power to 33 kV or at higher voltage outgoing feeders up to inter connection.

5.4 DOCUMENT

In this document unless otherwise stated:

i) The headings and paragraph numbering are for convenience only and shall be ignored in construing the agreement;

ii) The singular includes the plural and vice versa;

iii) References to natural persons include body corporate and partnerships;

iv) References to any enactment, ordinance or regulation include any amendment thereto or any replacement in whole or in part;

v) References to Articles, Clauses and Schedules, unless the context otherwise requires, refers to Articles of, Clauses of and Schedules to this document.

5.5 SCOPE OF WORK

The scope of work covered in this tender shall be as specified under Section-VII & VIII, Technical Specification as per Section IX & X and as mentioned elsewhere in this tender document. It is, however, understood and confirmed by the Contractor that the scope as described in the bid document is not limiting in so far as the responsibilities of the Contractor shall include inter-alia, carrying out any and all works and providing any and all facilities those are required in accomplishing an operating system, complying fully with all requirements as are envisaged of it, complete in all respect and satisfying all Performance and guarantee requirements stated or implied from the contents of the tender document. The Contractor shall make all required liaising with the all agencies along with concerned power utilities for interconnection of the wind farm with the State Grid, so as to commence exporting the power generated from hybrid project soon after its commissioning. The Contractor shall get tested all required equipment (like CTs, PTs, ABT meter, etc) from the power utility (if applicable) well before commissioning of the hybrid project so as to avoid any delay in commissioning of hybrid project and export of power.

It will be responsibility of the bidder to arrange for the capacity allocation / developers permission as applicable in the State by the Renewable Nodal Agency of the State for the development of hybrid (wind and solar) farm at the offer site.

The site(s) should have clear legal title and should be free from any encumbrance.

5.6 PLACEMENT OF ORDERS FOR AWARD OF CONTRACT

Refer respective clause in SECTION-II.

5.7 RESPONSIBILITIES OF THE CONTRACTOR

5.7.1 All expenses towards mobilization at site and demobilization including bringing in equipment, work force, materials, dismantling the equipment, clearing the site(s) after completion of work and liaisoning for interconnection of hybrid farm with the State Grid with concerned departments etc. shall be deemed to be included in the prices quoted and no separate payments on account of such expenses shall be entertained.

5.7.2 Contractor may have to work in energized or partly energized conditions. In such cases, it shall be the responsibility of the Contractor to arrange for necessary permits or shuts downs and provide skilled and responsible persons for the execution of works.

Contractor shall organize his works during the shutdown periods properly and complete the programmed works within the time given. Contractor shall not be paid any extra payments for working under the above said circumstances.

5.7.3 It shall be entirely the Contractor's responsibility to provide, operate and maintain all necessary construction equipment, scaffoldings and safety gadgets, cranes and other lifting tackles, tools and appliances to perform the work in a workman like and efficient manner and complete all the jobs as per time schedules. However, if any equipment/ facility are provided by Owner, the same shall be on chargeable basis.

5.7.4 Procurement and supply, in sequence and at the appropriate time, of all materials and consumables shall be entirely the Contractor's responsibility and his rates for execution of work will be inclusive of supply of all these items.

5.7.5 In case any material is issued by the Owner, then it will be properly used and maintained. Subsequent to completion of its use, it will be returned to Owner in good condition. In case of damage or misuse of such stores, Owner will recover the cost from the Contractor from the payments due to the Contractor.

5.8 INSURANCE

5.8.1 Insurance during Supply, Erection and Commissioning

a) Contractor shall at his own expenses effect insurance from IRDA approved agencies to the supplies, transit, personnel and all other related activities to the satisfaction of the Owner as follows including all third-party risks. A copy of all such policies will be given to the Owner along with. Owner shall be informed of all such insurance policies.

b) Insurance to cover marine & transit insurance.

c) Insurance to cover storage cum erection cum commissioning with suitable endorsements in the name of OIL. For this: -

- Bidder should submit the copy of the comprehensive policy along with the bid.
- Upon award of the work, the endorsed copy of the insurance should be submitted to OIL.
- In case of any claim, if the endorsed insurance cover is not sufficient to meet the claimed amount, the contractor will be liable for the shortfall and the same will be recovered as amount due under the contract."

d) Insurance to cover third party liability along with an undertaking indemnifying Owner from any such claim.

e) Workmen compensation and /or group personal accidents Insurance policy covering its employees and workers including Sub contractor

f) Contractor shall also effect and maintain any other insurance that may be required under any law or regulation or practice from time to time.

5.27.1 The Contractor shall take all reasonable precautions to prevent fire of any nature in the general area of his operations and he shall be responsible for all damage from fires due directly or indirectly.

5.9 FORCE MAJEURE

Clause No. 4.11 of GCC will be applicable. In addition to the provisions of clause 4.11 any hindrance any hindrance in work on account of Right of Way (ROW) / Right of Use (ROU) will not be considered as force majeure event during construction as well as O &M period. Bidder before claiming force majeure needs to provide data to substantiate his claim otherwise calculation of Machine availability will be carried as if there is no force majeure

5.10 SECURITY DEPOSIT CUM PERFORMANCE BANK GUARANTEE (SPBG)

5.10.1 The Contractor shall furnish, within fifteen days of Award of Contract / Letter of Award, a Security Deposit cum-Performance Bank Guarantee as per clause no. 2.29.2 of SECTION-II.

5.10.2 Delay beyond 1 month from the due date of submission of PBG: The BG against EMD submitted by bidder shall be encashed by OIL and the Project shall stand terminated.

5.10.3 For the purpose of calculation of the above delay charges, 'month' shall be considered as a period of 30 days.

5.10.4 In case the performance tests as specified elsewhere in the document are not successfully completed within the stipulated time period as given at clause 5.32 & 5.33, the Bank guarantee shall be extended for a suitable period so as to keep the validity for a period of 90 days from the expected completion of Performance Testing successfully.

5.10.5 The SPBGs shall be liable to be encashed wholly or partly at the sole discretion of the Owner, should the Contractor either fail to execute the work within the stipulated period or fail to fulfil the contractual obligations or fail to settle in full his dues to the Owner. In case of premature termination of the contract, the SPBG will be encashed and the Owner will be at liberty to recover the loss suffered by it from the Contractor.

5.10.6 The Owner is empowered to recover from the SPBG through invocation of B.G for any sum due and for any other sum that may be fixed by the Owner as being the amount or loss or losses or damages suffered by it due to delay in Performance and/or non-Performance and/or partial Performance of any of the conditions of the contract and/or non-Performance of guarantee obligations.

5.10.7 No interest is payable on SPBG amount.

5.10.8 In the event of full SPBGs being encashed, the Owner at its discretion and without prejudice to its any other rights, can terminate the contract.

5.11 TIME SCHEDULE

5.11.1 The time and the date of completion of the Contract as specified in the contract by the Owner without or with` modifications, if any, and so incorporated in the Letter of Award, shall be considered to be the heart of the Contract.

5.11.2 The bidder shall submit a detailed bar chart within the time frame agreed covering all activities with various key phases of supply and service obligations under the contract such as supply schedule and field erection activities within fifteen (15) days of the date of Letter of Award.

5.11.3 The time period mentioned below shall be reckoned from the date of issue of Letter of Award.

5.11.4 Commissioning schedule for the Project shall be as follows:

Complete hybrid Project in eighteen (18) months from date of issue of LOA.

The date of commissioning shall be the date as mentioned in the certificates of commissioning issued by the respective State Nodal Agency or the State utility or REMCL for complete project.

5.11.5 Transfer of Land

i) Transfer of private land in the name of OIL shall be got done within 6 months of LOA.

ii) Sub-lease of Government land in favour of OIL shall be got done as per policy of the State,

5.12 LIQUIDATED DAMANGES/ COMPENSATION

5.12.1 As commissioning time is the essence of the Contract and the same shall be firm and binding. The Bidder shall complete all activities of the Project viz. design, engineering, manufacture, supply, storage, all civil works, and installation, erection, testing, commissioning, and interconnection with State grid of wind and solar project respectively within the scheduled date. No part commissioning is allowed, commissioning of whole hybrid project is to be done as per time schedule clause 5.11.

5.12.2 Commissioning will be considered for the project as a whole when the complete hybrid facility has been interconnected with the State Grid within the stipulated project completion time.

5.12.3 In the event of the Contractor's default in timely completion of the work under the provisions of this Contract, the Contractor shall be liable to pay liquidated damaged at the rate of 0.5% (half Percent) of un commissioned portion of work for each week (7 days) or a part thereof of delay till the works are completed, subject to a maximum of 7.5%(seven & a half percent) of the total Contract Price (value of supply, Erection and commissioning excluding O&M Price). The decision of OIL with regard to the amount to be recovered from the Contractor will be final and binding on the Contractor.

5.12.4 The company may without prejudice to any other method of recovery, deduct the amount of such liquidated damages from any amount due to the contractor.

5.12.5 Compensation for non-conformance of Power Curve Testing / Performance test shall be separate and will be in addition to the Compensation for delay and shall be governed as per Clause No. 5.33 & 5.38 of this Section.

5.12.6 In case the entire capacity is not commissioned in stipulated time period as per REMCL tender, any additional payment made against un commissioned work by OIL should be refunded by Contractor.

5.12.7 The Bidder shall indicate duration of all the activities in activity chart in conformity with the overall schedule of the commissioning of project. A sample for activity chart is attached for reference at Bid Response Sheet No.20 (a & b). Bidder shall submit the

activity chart in form of Bar Chart which shall be discussed and finalized and shall be a part of Contract.

5.12.8 Both the Contractor & OIL agree that the above percentages of liquidated damage is genuine pre-estimates of loss/damage, which OIL would have to suffer on account of delay/breach on the part of the Contractor and the said amount will be payable on demand without there being any proof of the actual loss/or damage caused by such delay/breach. Decision of the Company in the matter of applicability liquidated damage shall be final & binding on the Contractor.

5.12.9 Clause No. 4.17 of GCC shall stands amended to the above extent.

5.13 EXTENSION OF TIME

5.13.1 Failure or any delay by the Owner due to any cause whatsoever, shall in no way effect or vitiate the contract or alter the character thereof or entitle the Contractor to damages or compensation thereof provided that the Owner may extend the time for completion of the work by such period as it may consider necessary or proper.

5.13.2 If the Contractor shall desire an extension of the time for completion of the project on the grounds of his having been unavoidably hindered in its execution or the work has been materially increased by Owner or other such grounds, he shall apply in writing to the engineer-in-charge within ten days of the date of occurrence of event on account of which he desires, such extension as aforesaid, and the Engineer - In- charge shall, if in his opinion (which shall be final) reasonable grounds have been shown thereof, shall process such extension of time as may be, as per the standard procedure of OIL. Whenever such extension is granted by the engineer in-charge, this would be without prejudice to the Owner's right under this contract.

5.14 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK

If at any time from the commencement of the work the Owner shall for any reason whatsoever not require the whole work or part thereof as specified in the bid to be carried out or, alteration in the work are required, the Engineer-In charge shall give notice in writing of the fact to the Contractor, who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full or prior to alteration.

5.15 CONTRACTOR'S OFFICE AT SITE(S)

During the execution of the contract, the Bidder shall ensure responsible person with authority to take decisions to be available at site(s). Such person deputed by the Contractor shall report to the Owner's/Consultant's Site in-charge, for smooth execution and timely commissioning of the work. The Contractor shall also provide and maintain a site office, at the site, for the use by the owner / its consultant / representative. Such office shall be open at all reasonable hours to receive instructions, notices or other communications. The Contractor shall be responsible for any misconduct/indiscipline by his employees or sub-Contractor/agent employee's. The Contractor shall abide by the instructions of the engineer in charge, if given in this regard. Contractor shall construct a dedicated store room to maintain minimum spares required for 2 years. List of spares available in the stores is to be shared with OIL on monthly basis.

EPC Bidder shall submit the Manpower Chart with hierarchy that would be deployed at

site.

5.16 **SUB-CONTRACTING OF WORK**

Contractor shall not subcontract or assign, in whole or in part, its obligations to perform under this contract, except with Company's prior written consent. In the eventuality of sub-contracting of work, Company will be informed in advance. However, the Contractor's liability or obligations will not get altered / delegated to sub-Contractor. If any sub-Contractor engaged upon the work at the site executes any work which in the opinion of the engineer in-charge is not in accordance with the contract documents, the Company may give written notice to the Contractor advising him to terminate such sub-contracts and the Contractor on the receipt of such notice shall terminate such contracts.

5.17 **POWER OF ENTRY**

5.17.1 In case the Contractor does not commence work in the manner described in the contract documents or if he shall at any time in the opinion of the Engineer in charge:

i) Fail to carry on the works in conformity with contract document /schedule or

ii) Substantially suspend work or the works for a continuous period of 14 days without permission from the engineer in charge, or

iii) Fail to carry on and execute the works to the satisfaction of the Engineer-in- Charge, or

iv) Commit or permit any other breach of any of the provisions of the contract on his part to be performed. or

v) If the Contractor abandons the works, or

vi) If the Contractor during the continuance of the contract becomes bankrupt.

In any of such events, the Owner shall have the power to enter upon the works and take possession of the materials, temporary works, equipment, tools and stocks thereon, and to revoke the Contractor's order to complete the works by his agents, other Contractors or workmen.

5.18 **USE OF COMPLETED PORTIONS**

5.18.1 Whenever in the opinion of the Owner the work or any part thereof is in a condition suitable for use and in the best interest of the Owner requires use, the Owner may take possession of the same. The Contractor shall, however, be not relieved of his pending obligations.

5.18.2 Prior to the date of final acceptance of the work by the Owner, all necessary repairs or renewals in the work or part thereof so used on account of defective materials or workmanship or due to the operations failure shall be at the expenses of the Contractor. Such use shall neither relieve the Contractor or any of his responsibilities under the contract, nor act as waiver by the Owner of the conditions thereof. However, if in the opinion of the Owner the use of the work or the part thereof delays the commissioning of the remainder of the work, the Owner may grant such extensions of time as it may consider reasonable. The decision of the Owner in the matter shall be final. The

Contractor shall not be entitled to claim any compensation on account of such use by the Owner.

5.19 POWER OF THE ENGINEER-IN-CHARGE TO ORDER SUSPENSION OF WORK

The Engineer-in-charge may, from time to time by direction in writing and without invalidating the contract, order the Contractor to suspend the work or any part thereof at such time or times and for such reasons as he may consider necessary. After such directions to suspend the work or any part thereof has been given, then proceed with the work or part thereof, directed to be suspended until he receives a written order from the Engineer-in-charge to so proceed. In the event of suspension, the Owner may under the provisions of the contract, extend the time for commissioning of the work or part thereof by such period as it may find reasonable. The decision of the Owner in the matter shall be final and binding on the Contractor.

5.20 PROGRESS REPORT & PROJECT REVIEW MEETING

The EPC contractor shall ensure that his designated project in charge shall submit fortnightly and monthly progress report (soft and hard copies) along with catch up plans against slippages to Consultant and simultaneously to Owner.

Owner shall hold project review meetings with Consultant and EPC Contractor at pre-defined periodicity.

5.21 FACILITIES – EXCLUSIVE

Facilities like SCADA, Pooling station /substation, 33 KV feeders from WEGs to Pooling station /substation, 33kv Feeder from solar project to Pooling station /substation & other Facilities that are needed to evacuate power from the individual WEG's and Solar plant for sale of energy at the metering point will be exclusive for OIL India. Pooling Station building and / or any office building(s) will also be exclusive and owned by OIL India.

FACILITIES – COMMON

Common Facilities include Pathways and approach roads within hybrid project. Right of use of land. Right of way (ROW) Pathways and approach roads shall form part of Common Facilities. Necessary leasehold or other rights like tenancy or license or ROW or any valid written approval shall be obtained by it and shall be maintained by him for the Life of the Project.

5.22 APPROVALS

Approvals are required to be in the name of bidder. In case these are in some other name / sister concern specific mentioned be made in the offer.

5.23 PAYMENT TERMS

Payments shall be released in the following manner after furnishing of Security cum Performance Bank Guarantee by the bidder and signing of Agreement as per provisions of bidding document:

Considering separate orders, the following payment terms will be applicable for the respective scope: -

Stage wise payments shall be released on prorate basis (i.e. WEGs wise basis) against each SOR including all applicable taxes and duties after furnishing of Contract Performance Bank Guarantee as well as furnishing of Indemnity Bond by the bidder

1A) <u>For Govt. (Revenue) Land:</u>

a.	50% on submission of copy of Allotment Letter of land issued by Competent Authority in favour of Bidder or his associate.
b.	50% on transfer of lease deed / sub-lease of land & on commissioning of WEGs, whichever is later or against submission of bank guarantee of equivalent amount valid till sub lease in favor of OIL after commissioning.

1B) <u>For Private Land</u>

a.	20% on Submission of copies of land related documents
b.	30% to be released against submission of application to State Nodal Agency.
c.	50% on submission of copy (ies) of sale deed in favor of OIL after commissioning

1C) For Forest Land

100% to be released on submission of Stage II clearance against furnishing bank guarantee of equivalent amount valid up to one year after commissioning of Project. The BG on prorate basis shall be released after land has been leased in favor of OIL.

Land means land & all land related development in the wind and solar park.

2A) For Supply of Plant and Equipment

a.	10% on completion of Engineering (Basic Engineering, QAP, manufacturing drawings, Construction drawings,)
b.	50% payment against receipt of material at site store on pro-rata basis.
c.	10 % against erection, testing and pre-commissioning of WEGs and solar project on prorate basis
d.	10% against commissioning of WEGs on pro-rata basis
e.	15% on submission of completion certificate as per clause no. 5.27 & 5.35 of the Wind & Solar Energy Project
f.	Balance 5% will be released on the successful completion of Power Curve Performance test of wind project and Final performance test of solar project **OR** after one year from the date of commissioning of the complete project, whichever is later

2B) For Erection and commissioning works

a.	20% on finalization of Micrositing, plant layout and mobilization of machinery, manpower and soil testing
b.	40% on completion of Foundation on prorate basis

c.	15% on completion of Erection of WEG and solar module installation on prorate basis.
d.	10% on erection of PSS and associated evacuation system
e.	10% against commissioning of WEG on prorate basis and solar project.
f.	5% on submission of completion certificate as per clause no. 5.27 & 5.35 of the Wind & Solar Energy Project

5.24 **PAYMENT PROCEDURE**

The Contractor shall raise bills against the completed supply/works as per para 5.23 above and payments shall be released within 30 days against undisputed bills after adjusting liquidated damage etc., if any.

B. Provision specific to wind portion of project

5.25 **STABILIZATION OF WEGs**

Soon after commissioning of WEGs in the wind farm the Contractor shall start undertaking stabilization activities for the turbines and related BOP. All stabilization activities shall be completed within stipulated period of two months from date of commissioning of last WEG of the project.

Post commissioning checks on turbines viz. fine tuning of pitching & yawing mechanism, checks for oil leakages, braking system, voltage converters, providing of auto start facility on each WEG irrespective of Grid failure period, any other checks as prescribed in Contractor's Protocol, checking of all electrical installations & rectification of defects observed, if any, attending to all punch points, torqueing, checks of all bolts& lubrication of bearings after first 500 operational hours of WEGs.

Further Stabilization of all WEG's in the wind farm shall be considered to have been achieved on successful accomplishment of the following activities:

5.25.1 Machine availability during stabilization period should not be less than 70%. Minimum monthly machine availability after stabilization should be 85% for each WEG for the next one month.

5.25.2 Project has been completed in all respect including power evacuation facility till utility grid

5.25.3 Dedicated SCADA has been commissioned and fully operational including connectivity at Owner's premises. There should not be any discontinuity for a minimum period of 15 days from the date of connectivity at owner's premises & it remains operational thereafter. In case of any interruption during test period of 15 Days test period will start afresh.

5.25.4 Project is free from occurrence of repetitive fault of the same nature.

5.25.5 In case stabilization work of all the Project which includes balance of Plant (BOP) is delayed beyond stipulated period of two months by the Contractor the Comprehensive O&M period shall commence from the date when successful stabilization of Project & BOP has been done and certified by the Engineer-in-Charge. The SPBG shall also have to be extended for the same period.

5.25.6 Communication Connectivity of pooling station to OIL, GETCO/SLDC, REMCL and S&F

agency (QCA) for the purpose of scheduling & forecasting.

5.25.7 Stabilization will be considered after stabilization of complete hybrid project.

5.26 RATES TO BE FIRM AND INCLUSIVE OF ALL TAXES

5.26.1 The rates quoted by the Contractor shall remain firm inclusive of all taxes, duties and binding till commissioning of the project in all respect. The rates shall not be subject to escalation. Rates shall be deemed to include and cover all costs, expenses, taxes, duties, levies, royalties, foreign exchange variation, etc. and liabilities of every description and all risks associated in execution, for completing and handing over the work to the Owner by the Contractor. However, any statutory variation in the applicable rates taxes and duties including new taxes if any during the commissioning period will be to OIL INDIA's account.

5.26.2 Owner will provide entry Form for transportation of material. The Owner shall deduct income tax, Works-Contract tax or any other similar tax as applicable on works contract as per the prevailing rates from the bills of the Contractor. Owner shall not be responsible for any liability on this account on the Contractor in respect of this contract and exclusion of any applicable taxes at prescribed rates due to ignorance or otherwise shall not form a reason for claiming anything extra at a later date.

5.27 COMPLETION CERTIFICATE

5.27.1 The contactor shall submit Completion Report of the project to Owner. The Completion Report shall consist of the following documents:

(i) Copy of the Commissioning Certificate issued by the competent authority.

(ii) Technical documents as per scope of work & technical specifications according to which the work has been carried out.

Four sets of as built drawings showing therein modification and corrections, if any, made during the course of execution signed by the Contactor. A soft copy of as built drawings shall also be submitted.

Copy of complete layout of the Project including Evacuation system

Copies of test Certificates for type / routine tests performed on major equipment

Contractor has provided the list of recommended spares with detailed specification, source and price for further procurement for further procurement

O&M Manuals – 3 sets

Copies of Statutory clearances / permissions.

Certificate / undertaking for making payment of all statutory requirements, labour wages and others and for any such claims.

An undertaking confirming the payment of all statutory taxes & duties, or document (s) having evidence of paying statutory duties, taxes etc. as per requirement of concerned statutory authorities.

Certificate regarding completion of the facility in all respect including SCADA by the Engineer-In-Charge/ Consultants.

Providing real time monitoring at OIL India Jodhpur office including to QCA appointed for S & F, GETCO/ SLDC and REMCL.

5.27.2 Owner shall issue Completion Certificate after verifying from the completion documents and satisfying itself that the work has been completed in accordance with details set out in the construction and erection drawings and the contract documents. No Completion Certificate shall be given nor shall the work be deemed to have been executed until the export of generated wind power commenced, statutory requirements are completed and all scaffolding, surplus materials and rubbish is cleaned off the site completely

5.28 ESTIMATED ANNUAL ENERGY PRODUCTION

Bidder shall submit estimated Annual Energy Production (AEP) of the offered wind farm by using Wind Resource Assessment tools.

The bidder shall submit the following details with the bid both in soft copy and hard copy: -

1. Details of reference wind mast i.e.
   a) NIWE's mast or Bidder's own mast. The minimum height of the mast shall be 80 Meters.
   b) Location of the mast with respect to offered site giving co-ordinates and elevation. Wind mast location should not be more than 10km from farthest WEG location offered.
   c) Height of the mast indicating sensor heights.
   d) Period of wind data of the mast considered for calculation which should not be older than 10 years of bid submission date.
   e) Annual Air Density of the site(s).
   f) Wind data of the mast from the date of installation till the date of removal or one month prior to the bid opening, if the mast is in existence in soft mode only.
2. Wind data time sheet for a minimum period of one year or joint frequency distribution of wind data for two levels in WAsP format.
3. De-rating, if any, due ambient conditions.
4. Digitized contour map at contour intervals of 2 meter for the proposed site(s) for complex terrain and 5 m for uniform terrain and 10 m / 20 m for surrounding area including roughness considered in the form of MAP file as input to WAsP. The digitized map should cover at least 2 km area in all directions beyond boundary line of offered site(s) and reference wind mast location.
5. Roughness map should be submitted separately as well as incorporated with digitized contour map
6. Certified Power curve of the offered WEG.
7. Thrust curve of the offered WEG.
8. Wind Resource Assessment report covering estimated annual energy generation of the entire wind farm and its monthly yield in percentage of annual generation including Micro-siting along with assumptions considered.

9. AEP of each WEG as per Wind Resource Assessment tool for the complete wind farm for P50, P75 & P90 exceedance levels.

10. The bidder shall furnish details of nearest wind mast of NIWE

11. Year to year for past 20 years period based on Satellite data from MERRA. Details of month wise Wind variation, general wind data of all potential sites in India are with MERRA. In case the data is not available for the offered site, bidder can submit the letter from MERRA to authenticate his claim. In such cases the DATA from other recognized agency may be submitted.

12. Electrical single line diagram of wind farm from WEG up to the metering point of SEB/DISCOM indicating size, length and brief specification of cable, OH line conductor and transformer etc. along with calculation of transmission losses

13. Actual energy generation of the WEGs already existing in offered area or nearby area from the date of installation of such WEGs.

14. Following correction factors mentioning percentage thereof to be considered for AEP estimation shall be furnished clearly:

    a) Machine Availability: Shall be considered as 96% or as offered by the bidder, whichever is lower.

    b) Grid Availability: Shall be considered as 95%

    c) Array Efficiency / Wake loss

    d) Air Density

    e) Internal/Transmission losses up to metering point and internal consumption

    f) Year to year wind variation

    g) Distance & Height of wind mast

    h) Other uncertainties

    i) Any other correction factors

Based on the above inputs, Owner/Consultant shall get the estimated deliverable generation worked out. If required, Owner/ Consultant may ask for additional information. Further, Owner and Consultant's representative may visit the offered site(s) and collect site(s) specific information for which bidder will provide all the necessary assistance.

Owner/Consultant, during site(s) visit, will collect actual energy generation of the WEGs installed in that area or nearby area from the date of installation of such WEGs and calculate the average annual energy generation so as to arrive at final Estimated Annual Energy Production of the offered site(s).

Wind data submitted by the bidder for own mast should have NIWE (National Institute of Wind Energy) report on verification procedure with data like Wind Power Density (WPD), annual mean wind speed etc.

Estimated deliverable annual energy production (AEP) will be worked out by the owner/consultant by giving effect of array efficiency, machine availability, grid availability, wind variation, internal consumption, and evacuation losses and as accepted by Owner, shall be considered for financial evaluation of the Bids.

Necessary corrections shall be carried out by Owner or its Consultant in the AEP furnished by bidders. The lower of the two estimated generation, after corrections, shall be considered for evaluation of bids.

No change in data once furnished by the bidder at the time of submission of the bid relating to estimation of generation like machine model, rotor diameter, hub height, location of site(s), Micro-siting plan of the wind farm etc.; shall be permitted. However, during the execution of the project, in case it becomes necessary for the Bidder then changes in location may be accepted by Owner but this should not affect the annual energy estimation. In such an event Owner will get the estimation of generation of the wind farm checked from the Consultant with the changed data and if the generation so worked out is found to be less than what was considered for financial evaluation, then the Bidder shall modify the financial parameters in such a way that the post-tax IRR is maintained.

Revision in annual energy estimation, if required, will got done from consultant and extra cost if any will on account of bidder.

5.29 **TESTS / INSPECTION**

5.29.1 Inspection shall be carried out on 10% quantity of the ordered equipment for the major components viz nacelle assembly, rotor blades, towers, gearboxes, generators, and power transformers. For HT/EHT Circuit Breakers manufacturers test certificate shall be submitted. All other items like cables, conductors, relays and associated equipment/components shall confirm to relevant international/national standards.

5.29.2 In case of imported components, the same should be inspected at the stock yard / warehouse of bidder for 100 % quantity by TPI as well as 10% by OIL India. However, OIL India may depute their representatives for plant inspection & prototype inspection at overseas works.

5.29.3 After the award of work, the successful bidder shall furnish a complete list and details of all tests to be conducted on all major components.

5.29.4 The bidder shall also furnish a schedule for inspection / testing, so that Owner may associate his representative for witnessing of the tests. The Contractor shall also furnish copies of such test/inspection reports for reference and records of the Owner.

5.29.5 Owner may depute its personnel or authorized representative or consultant for witnessing the testing of major components at manufacturer's works. The bidder shall make all the required arrangements for such testing at its work.

5.29.6 Contractor shall arrange and extend necessary cooperation for effectively carrying out inspection / testing. However, this shall not absolve the responsibility of the Contractor in providing the performance guarantee/warrantee.

5.29.7 The scope of work broadly includes review of manufacturing / fabrication procedures, QA/QC plans, review of Non-Conformance Report (NCR) issued by the Contractor during fabrication stage, review of documents including Quality Assurance Plan during manufacturing/ fabrication activities.

5.29.8 All the standard tests in accordance with applicable Standards adopted, shall be carried out at the manufacturer's works on the entire major component and their accessories, so as to ensure efficient operation and satisfactory performance of all the component/parts.

5.29.9 Any special test to be performed shall be mutually agreed upon between the Bidder and Owner

5.29.10 All equipment shall be further tested at site(s), wherever required, before commissioning.

5.29.11 The work is subject to inspection at all times and at all places by Owner. The Contractor shall carry out all instructions given during inspection and shall ensure that the work is carried out according to the relevant codes and practices.

5.29.12 Decision of Owner in regard to the quality of work and materials and its performance with respect to the specifications and drawings shall be final.

5.29.13 If any item is not found conform/ing to standards during test/inspection, the same shall be replaced / rectified by Contractor without any cost to Owner and shall be re-offered for inspection.

5.30 GUARANTEE / WARRANTEE

5.30.1 Any material, equipment and/or accessories which prove defective or which fail to meet the design guarantee or Performance Guarantee during the defects liability period (which is 22 months from the date of completion of Stabilization Period of last WEG) the Contractor shall replace / rectify at his own cost, such material, equipment and/or accessories.

5.30.2 The Contractor shall guarantee the wind farm and installation work, for a period of 22 (twenty two) months from the date of completion of Stabilization Period of last WEG. Any damage or defect that may arise or lie undiscovered at the time of issue of completion certificate, connected in any way with the equipment or materials supplied by him or in the workmanship, shall be rectified or replaced by the Contractor at his own expenses, as deemed necessary by the Engineer-in-Charge or in default, the Engineer-in-Charge may cause the same to be made good by other workman and deduct expenses (for which the certificate of Engineer-in-charge shall be final) from any sums that may be then or at any time thereafter, become due to the Contractor or from his SPBG.

5.31 STATUTORY APPROVALS FOR WORKS

5.31.1 All statutory approvals/permissions related to installation of the wind power project and carrying out its operation & maintenance (O&M) as may be required under applicable law, rules shall be obtained by the Bidder and such cost shall be borne by the bidder.

5.31.2 Inspection and acceptance of the work as above shall not absolve the Contractor of any of his responsibility under this contract.

5.31.3 If any penalty/levy becomes payable to the State Electricity Utility on account of low power factor of the wind farm, the same shall be borne by the Contractor only.

5.31.4 All fee/charges payable to any statutory authority on account of operation & maintenance of wind farm shall be borne by the Contractor during the warrantee period of the contract.

5.31.5 The Contractor shall be responsible for interconnection of wind farm with the State grid, so as to export power from wind farm. The date of commissioning will not be considered prior to inter connection of all the WEGs of Wind farm with the State grid. Therefore, the Contractor should make all efforts for installation of metering equipment, etc, and carry

out the inter connection prior to the final commissioning of the wind farm.

5.31.6 So long as commissioning of the project is not delayed and operation and maintenance is not hampered due to delay in statutory approvals, no Price Reduction shall be affected.

5.32 96 HOURS SHORT TIME TEST RUN

This short time test shall be conducted on all the WEGs.

The test shall be carried out during conditions of high wind regime of offer site so that the machines are subjected to fluctuating wind thrusts and their mechanical endurance established.

The test shall be considered successful if values of observed parameters of WEGs are found within the set values.

For conducting this test, the WEGs shall be run continuously for 96 hours without any interruption. In case of interruption or stoppage of WEG during the test, the test shall not be considered to have been completed. In such an event the test shall be conducted afresh.

The test shall be considered successful if values of observed parameters of WEGs are found within the set values.

In case of non-conformance of the parameters of any component/item of WEG, replacement of the defective component shall be done and test repeated till such time it is successful.

The tripping of WEG on account of protective relays due to adverse atmospheric conditions will not be considered as outage.

5.33 POWER CURVE PERFORMANCE TEST

5.33.1 Power curve performance test

Power curve performance test on one WEG in the wind farm of capacity **41 (±5%) MW** shall be conducted to ascertain performance of the WEG with reference to certified power curve of the machine. The test shall be conducted first year of the wind energy project in accordance with the methodology as described below: -

Power curve performance test shall be carried out for a period of one month during windy season as specified in the Contract.

Contractor shall submit a proposal suggesting at least two WEGs along with locations of corresponding wind masts in the wind farm observed suitable for carrying out power curve test for consideration by OIL India. In case two options are not feasible to offer due to site constrains, contractor an OIL India / consultant shall discuss, mutually agree and finalize the mast location.

Following factors shall be taken into consideration for submission of proposal:

- Topographical variations
- Other wind turbines

- Obstacles (buildings, trees etc.)
- Location of meteorological (wind) mast

OIL India, its Consultant and Contractor's officials shall jointly inspect the wind farm site for selection of one designated turbine with related wind mast out of the short-listed machines for the purpose of power curve test. The test shall be carried out on this designated turbine.

Site checking supply & installation of wind mast and onsite facilities / support for testing and monitoring shall be the responsibility of the Contractor.

Contractor shall install a wind mast of height equal to hub height of the designated turbine near the selected location at a distance between 2D-2.5D (where D is rotor diameter) from the designated turbine in consultation with OIL India / consultant.

Mounting height of primary anemometer, temperature sensor, pressure sensor and RH meter shall the same as hub height of the test turbine. The mast shall be provided with lightening protection covering complete wind mast installation against any surge. The mast shall record wind data at height equal to that of hub height of the turbine.

The wind data recorded by this mast during test period shall be taken as reference data for purpose of power curve verification test turbine. The mast shall be maintained at site up to completion of power curve test and acceptance by OIL India and defect liability period whichever is later.

5.33.2 **Power curve verification**

For Power curve verification the following equipment are to be installed along with wind mast, wind vanes etc.:

a) Cup anemometer shall be Class A type or Class B type depending upon the requirement of topographical variations.

b) Pressure gauge, Temperature sensor and Humidity recorder at suitable height.

c) Data logger with Solar panel, battery, modem for real time remote monitoring and recording of data.

d) Metering arrangement with LT current transformers (CTs) of suitable ratio, LT potential transformers (PTs) of appropriate ratio & TVM duly calibrated by an accredited test laboratory / house shall be provided near the LCS or on generation side or on the low voltage side of DP yard transformer.

e) The entire metering arrangement shall be sealed for the test period. Similarly, data logger at the wind mast shall also be sealed.

f) Accuracy class of all the measuring equipment shall be 0.5 or better. Bidder shall furnish valid calibration certificates of the measuring instrument in this regard.

g) For any further reference, IEC-61400-12-1: 2005(E) updated as on the date of testing, titled "Power Performance Measurements of Electricity Producing Wind Turbines" shall be followed.

h) In case bidder offers more than one site the power curve performance test will be conducted at all the sites,

5.33.3 **Setting up of the system for verification of power curve**

1) Contractor shall furnish required drawings of wind mast along with arrangement for mounting of all sensors.

2) Contractor shall furnish valid latest calibration certificates of all the sensors to be mounted on the wind mast.

3) Contractor shall furnish technical specifications of all measuring instruments & TVM.

   Valid latest calibration certificates / reports of all the measuring instruments & TVM from NABL accredited test laboratory shall be furnished by the Contractor. All required instrumentation including for relative humidity measurement shall be provided.

   Consultant shall examine the information furnished by Contractor and submit recommendation to OIL India.

4) Contractor shall proceed ahead with setting up of wind mast after approval by OIL India. Care shall be taken that guys at highest for holding the wind mast structure in vertical position are fixed at a point which is at least 1.5 m lower than primary anemometer level.

5) Consultant shall monitor and verify the correctness of wind mast installation and give appropriate guidelines to Contractor for operation of the same for the purpose of verification of power curve.

6) Recorded wind data (speed and direction) of wind mast and WEG under test will be verified for similarity, confirming that the wind at WEG & Mast is of same intensity and direction.

5.33.4 **Power curve verification exercise**

1) Contractor shall carry out necessary prior checks on the selected WEG to avoid any stoppage of the turbine during test period.

2) After checking the wind mast and related instrumentation, operation for ascertaining operational reliability shall be carried out. Contractor shall confirm readiness for commencement of the test and finalize date of start in consultation with OIL India & its consultant

3) OIL India Consultant and Contractor's representative shall jointly witness commencement of the test. The test would commence with synchronization of the data logger of wind mast, LCS of test turbine and energy meter (TVM). Immediately after synchronization, required sealing shall be done by the team jointly.

4) All relevant initial readings at the time of the commencement of the test would be recorded jointly by the team.

5) The parameters to be recorded shall be as per table given below:

Sl. No.	Date	Turbine Status	Error Code	Description of Error	Duration of Stoppages			Remarks
					From	To	Time Duration	

* Grid Non-availability shall be specifically recorded in Column “Remarks”

6) On the date of completion of the test, the team would jointly open the seals and retrieve the data from data logger, LCS and energy meter, if applicable. Final readings at the time of the commencement of the test would be recorded jointly by the team.

7) Analyse the data gathered for consistency and suitability for analysis.

8) Stoppages details provided shall be verified from relevant records at LCS, CMS and substations at the end of test duration.

9) In case, the data gathered is found to be erroneous and not suitable for analysis, should find out the reason for the same, advice corrective action to the contractor and repeat Steps 3 to 7.

10) Finalize the data sets to be considered for preparing wind speed distribution and for calculation of correction factors for air density, array loss, machine availability, grid availability.

5.33.5 **Analysis and report on power curve guarantee verification**

a) Average site air density shall be considered for test period shall be calculated from pressure and temperature data downloaded from the logger after correction for humidity as measured. GEEG would be corrected for air density and array losses as calculated.

b) The period on account of non-availability of grid and WEG for individual stoppage slot, should be removed from the wind speed data recorded in 10-minute bins.

c) Wind speed frequency distribution for the test period shall be prepared from the raw wind data captured by the mast during the test after removing the data as per (b).

d) Certified power curve (CPC) of the WEG as considered in the Contract, shall be applied to the above wind speed distribution to arrive at gross expected energy generation (GEEG).

e) Following factors shall be applied for arriving at net expected energy generation (NEEG)

(i) The power curve should be corrected at site Air density worked out for the site from the data as actually recorded.

(ii) Array loss at the actual factor for test turbine as per Final Micro Siting Report of the complete wind farm by wind flow modelling software viz. WAsP shall be considered.

(iii) 2% on account of flow distortion and Measuring accuracy

f) Once the WEG is shortlisted for the test, only preventive checks and maintenance

activities as indicated in the test procedure shall be carried out till the time the test is completed. No modification / calibrations to the selected WEG or parameters of WEG, other than those indicated in the procedure, should be carried out till completion of the test. Any work to be carried out on the test turbine prior to start and completion of the test would be intimated to OIL India and Consultant.

5.33.6 **Acceptance Criteria and Compensation for lower performance.**

a) The NEEG worked out as per methodology given above shall be verified against actual energy generated by the WEG as recorded by the tri-vector meter (TVM) during test period.

b) If actual generation recorded by TVM is equal to or more than 95% of NEEG then the turbine shall be deemed to have met power curve performance guarantee.

c) If the actual generation as recorded at the WEG meter is less than 95% of the calculated net estimated generation from the wind mast data, then bidder shall conduct the test again after making necessary checks & settings, as per the above procedure.

d) In case the test is again unsuccessful, technical explanation for this shall be given by Contractor to OIL India. If OIL India feels satisfied with the explanation submitted by the contractor, it may consider for having fulfilled the requirement of Power Curve test.

e) In case OIL India is not satisfied with such technical explanation submitted by the contractor, the contractor shall have the option to get the power performance measurement Test carried out / done by NIWE as per prevailing standards. However, all costs towards the same shall be borne by the Contractor. If the test by NIWE proves the power curve performing up to 95% of the offered power curve, the power curve performance Test shall be considered as successful.

f) In case, the contractor does not opt for further Testing by NIWE or the test conducted by NIWE also fails to show performance of power curve for at least 95%, the Contractor shall compensate the loss due to shortfall in the test in the manner as given here under: -

(i) For every 1% (or part thereof) shortfall in actual generation than 95% of NEEG, the contractor shall pay to OIL India @ 0.5% (half percent) of the Contract Value of supply, erection and commissioning of wind power project.

(ii) In case the actual energy generation as recorded at the TVM is less than 90% of AEP, the bidder shall rectify defects in all the WEGs, as the case may be, in the manner that power generation is not less than 95% of AEP. In such an event the power curve performance test should be repeated again after rectification at the cost of bidder. In case the actual generation, after rectification work, is equal to or more than 95% of NEEG the test will be deemed to have passed the performance test. In this case, the Contractor shall compensate OIL India for the actual revenue loss during the period when generation was lower due to poor performance of the WEGs.

C. Provision specific to solar portion of project

5.34 STABILIZATION OF SOLAR PLANT/ OPERATION ACCEPTANCE TEST

Stabilization/ operation acceptance test (OAT) of solar plant shall be considered to have been achieved on successful accomplishment of the following activities:

5.34.1 Project has been completed in all respect including inter connection with state utility

5.34.2 Plant performance found satisfactory on real live condition for a period of 15 days on continuous basis for trouble free operation

5.34.3 Dedicated SCADA has been commissioned and fully operational including connectivity at plant and OIL India Jodhpur office, QCA, GETCO / SLDC and REMCL.

5.34.4 Solar plant is free from occurrence of repetitive fault of the same nature for an uninterrupted period of 15 days.

5.34.5 PR test as per annexure V

5.34.6 Stabilization will be considered after stabilization of complete hybrid project.

5.35 **COMPLETION CERTIFICATE**

5.35.1 The contactor shall submit Completion Report of the project to Owner. The Completion Report shall consist of the following documents:

(i) Copy of the Commissioning Certificate issued respective State Nodal Agency or the State utility for complete project

(ii) Technical documents as per scope of work & technical specifications according to which the work has been carried out.

(iii) Four sets of as built drawings showing therein modification and corrections, if any, made during the course of execution signed by the Contactor. A soft copy of as built drawings shall also be submitted.

(iv) Copy of complete layout of the solar plant including Evacuation system

(v) Copies of test Certificates for type / routine tests performed on major equipment

(vi) Contractor has provided the list of recommended spares with detailed specification, source and price for further procurement for further procurement

(vii) O&M Manuals – 3 sets

(viii) HSE Manual - 3 sets

(ix) Copies of Statutory clearances / permissions.

(x) Certificate / undertaking for making payment of all statutory requirements, labour wages and others and for any such claims.

(xi) An undertaking confirming the payment of all statutory taxes & duties, or document (s) having evidence of paying statutory duties, taxes etc. as per requirement of concerned statutory authorities.

(xii) Certificate regarding completion of the facility in all respect including SCADA by the Engineer-In-Charge / Consultants

5.35.2 Owner shall issue Completion Certificate after verifying from the completion documents and satisfying itself that the work has been completed in accordance with details set out in the construction and erection drawings and the contract documents. No Completion Certificate shall be given nor shall the work be deemed to have been executed until the

export of generated solar power commenced, statutory requirements are completed and all scaffolding, surplus materials and rubbish is cleaned off the site completely

5.36 **NEEGG/AEP and Performance ratio**

5.36.1 The Bidder shall be required to quote the Net Electrical Energy Generation Guarantee (NEEGG) for twenty five (25) years period at the metering point. The Bidder shall give NEEGG and PR Ratio per annum in BRS 10 after considering proposed configuration and all local conditions, solar insolation, wind speed and direction, air temperature & relative humidity, barometric pressure, rainfall, sunshine duration, grid availability and grid related all other factors and losses due to near shading, incidence angle modifier, irradiance level, temperature loss, array loss, module quality loss, module array mismatch loss, soiling loss and various inverter losses etc. To assess/ verify feasibility of quoted NEEGG, Bidders are required to provide computation documents along with considered factors based on which NEEGG has been computed.

5.36.2 Bidders are expected to undertake their own study of solar profile and other related parameters of the area and make sound commercial judgment about power output i.e. Net Electrical Energy Guaranteed Generation. It shall be the responsibility of the Bidder to access the corresponding solar insolation values and related factors of solar plant along with expected grid availability. The Bidder should access all related factors about the selected Site for the Project and then quote the NEEGG for the proposed Project.

5.36.3 The Contractor shall be responsible for achieving NEEGG. For any shortfall in NEEGG corresponding to the offer, the compensation shall be recovered from the Contractor as per Clause no. 6.23. The Contractor shall maintain the Plant equipment including its repair, replacement, overhauling, etc., so as to ensure guaranteed NEEGG per year, for which the Owner shall pay the agreed O&M Contract Price and the applicable taxes. NEEGG guaranteed shall not be construed as limiting value of generation. The Contractor shall maintain such that maximum generation is achieved.

5.36.4 The Bids with NEEGG of less than or equal to **2,94,36,000 kWh** (Two Crore Ninety four Lakh Thirty six Thousands kilo-Watt hours) for the first year for 14MW (AC) solar plant at Delivery Point (metering at GETCO end sub-station) shall be summarily rejected. The Bidder shall submit PVsyst report along with NEEGG.

5.36.5 The deration in NEEGG quoted for any year shall not be more than 1% of the quoted for the first year. If the Bidder anticipates any degradation of the modules during the first year, it shall be taken care of to provide additional capacity of solar PV modules to meet guaranteed generation at the end of first year to avoid liquidated damages/compensation on account of Performance Guaranteed Generation. The NEEGG of consecutive year should not be more than the previous year's NEEGG. Bids not following these conditions shall be summarily rejected.

5.36.6 This NEEGG shall be used for the evaluation of the Bids as clause 3.16 of Bid Evaluation Methodology (BEM)

5.37 **COMPENSATION:**

Refer Annexure V

5.38 **PERFORMANCE RATIO GUARANTEE TEST**

5.38.1 The test to prove the Performance Guarantee shall be conducted at site by the contractor in presence of Owner's/Consultant representative. The PG test procedure

shall be submitted by successful vendor after the award of the contract for review and approval by OIL/Consultant. This test shall be binding on both the parties of the Contract. Any special equipment, instrumentation tools and tackles required for successful completion of the Performance Guarantee Test shall be provided by the Contractor free of cost.

5.38.2 The procedure for PG demonstration test shall be as follows:

i) A calibrated pyranometer shall be installed by the contractor at the location mutually agreed by the Contractor and Owner/Consultant. The test report for the calibration shall be submitted by the contractor for approval by the Owner/Consultant. The output of this pyranometer for three months of the PG test shall be made available at SCADA.

ii) "Achieved energy production" exported from the plant shall be noted for three months. For this purpose, the energy recorded in the incoming feeder meter from the solar plant shall be taken into account.

iii) This recorded energy shall be compared with the "Nominal Energy Production" as mentioned in 5.26 above for 3 months.

5.38.3 Following factors shall be considered for computing the "NEEGG/CUF/PR Test"

i) Generation loss due to grid outage: The measured global solar radiation of the period of the power evacuation system shall be excluded to calculate average global solar radiation for the period of the PG test.

ii) Effect due to variation in annual insolation shall only be considered for computing the NEEGG / CUF.

iii) Effect due to variation of meteorological parameters e.g. ambient temperature, wind speed, humidity etc. shall not be considered.

5.38.4 In case of non-achievement of the desired performance of the plant, the contractor, in its own interest, take adequate measures, such as providing additional modules etc., to improve the performance of the plant at no additional cost to OIL. Otherwise compensation as per clause no 5.26 will be applicable at the end of the year.

5.39 **TESTS / INSPECTION**

5.39.1 Inspection shall be carried out on 10 % quantity of the ordered major equipment viz. solar module, Inverter, Transformer, String Monitoring Box (SMB) and Module Structures. All other item like cables, conductors, relays and associated equipment/components shall conform to relevant international/national standards.

5.39.2 In case of imported components, the same should be inspected at the stock yard warehouse of bidder for quantity mentioned in above clauses.

5.39.3 Test certificates for all major/critical items (Modules, Inverters, Transformer, String Monitoring Box (SMB), Module Structures shall be submitted to owner and its consultant along with in process checks carried out at time of manufacturing, assembling, pre dispatch with applicable standards at no cost to OIL INDIA. Copies of test certificates

for such inspections in triplicate shall be supplied before dispatch of the equipment

5.39.4 After the award of work, the successful bidder shall furnish a complete list and details of all tests to be conducted on all major components

5.39.5 The bidder shall also furnish a schedule for inspection / testing, so that Owner may associate his representative for witnessing of the tests. The Contractor shall also furnish copies of such test/inspection reports for reference and records of the Owner.

5.39.6 Owner may depute its personnel or authorized representative or consultant for witnessing the testing of major components at manufacturer's works. The bidder shall make all the required arrangements for such testing at its work.

5.39.7 Contractor shall arrange and extend necessary cooperation for effectively carrying out inspection / testing. However, this shall not absolve the responsibility of the Contractor in providing the performance guarantee/warrantee.

5.39.8 The scope of work broadly includes review of manufacturing / fabrication procedures, QA/QC plans, review of Non-Conformance Report (NCR) issued by the Contractor during fabrication stage, review of documents including Quality Assurance Plan during manufacturing/ fabrication activities.

5.39.9 All the standard tests in accordance with applicable Standards adopted, shall be carried out at the manufacturer's works on the entire major component and their accessories, so as to ensure efficient operation and satisfactory performance of all the component/parts.

5.39.10 Any special test to be performed shall be mutually agreed upon between the Bidder and Owner

5.39.11 All equipment shall be further tested at site(s), wherever required, before commissioning.

5.39.12 The work is subject to inspection at all times and at all places by Owner. The Contractor shall carry out all instructions given during inspection and shall ensure that the work is carried out according to the relevant codes and practices.

5.39.13 Decision of Owner in regard to the quality of work and materials and its performance with respect to the specifications and drawings shall be final.

5.39.14 If any item is not found conforming to standards during test/inspection, the same shall be replaced / rectified by Contractor without any cost to Owner and shall be re-offered for inspection.

5.40 GUARANTEE / WARRANTEE

5.40.1 Any material, equipment and/or accessories which prove defective or which fail to meet the design guarantee or Performance Guarantee during the defects liability period (which is 22 months from the date of completion of Stabilization Period) the Contractor shall replace / rectify at his own cost, such material, equipment and/or accessories.

5.40.2 The Contractor shall guarantee solar farm and installation work, for a period of 24 (twenty-four) months from the date of completion of Stabilization Period. Any damage or defect that may arise or lie undiscovered at the time of issue of completion certificate, connected in any way with the equipment or materials supplied by him or in the workmanship, shall be rectified or replaced by the Contractor at his own expenses, as deemed necessary by the Engineer-in-Charge or in default, the Engineer-in-Charge may

cause the same to be made good by other workman and deduct expenses (for which the certificate of Engineer-in-charge shall be final) from any sums that may be then or at any time thereafter, become due to the Contractor or from his SPBG.

5.40.3 Guarantee / Warrantee for Solar Module should as under:

a) PV modules must be warranted with linear degradation rate of power output except for first year (up to 2% including LID) and shall guarantee minimum 80% of the initial rated power output at the end of 25 years.

b) The modules shall be warranted for minimum of 10 years against all material/ manufacturing defects and workmanship.

c) The above warranties shall be backed by third party insurance for 25 years in favour of OIL.

5.40.4 Power Conditioning Unit shall be warranted for minimum of 5 (five) years against all material/ manufacturing defects and workmanship.

5.41 STATUTORY APPROVALS FOR WORKS

5.41.1 All statutory approvals/permissions related to installation of the solar power project and carrying out its operation & maintenance (O&M) as may be required under applicable law, rules shall be obtained by the Bidder.

5.41.2 Inspection and acceptance of the work as above shall not absolve the Contractor of any of his responsibility under this contract.

5.41.3 All fee / charges payable to any statutory authority on account of operation & maintenance of solar plant shall be borne by the Contractor during the warrantee period of the contract.

END OF SECTION-V

SECTION–VI

SPECIAL CONDITIONS OF CONTRACT FOR OPERATION & MAINTENANCE (O&M) OF HYBRID POWER PLANT

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SECTION–VI

SPECIAL CONDITIONS OF CONTRACT FOR OPERATION & MAINTENANCE (O&M) OF HYBRID ENERGY PROJECT

A. COMMON FOR COMPLETE HYBRID PROJECT

6.1 TERM OF O&M CONTRACT

The Operator shall be responsible for Comprehensive Operation and Maintenance of the Hybrid (wind& Solar) power project for a period of twenty-Five (25) years from the date of stabilization/ OAT of the wind and solar plant, whichever is later.

6.2 BATTERY LIMIT

The battery limit for bidder during the period of O&M contract shall cover complete wind & solar energy plant and power evacuation system up to the point of interconnection.

The bidder shall be responsible for arranging at his own cost all spare parts required for replacement for keeping the wind & solar plant operational, repairs / replacement of any defective equipment(s) at his own cost as required from time to time, schedule and preventive maintenance, major overhauling of the equipment, maintaining log sheets/record for operational detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, deployment of security personnel so as to ensure smooth operation for the entire period of O&M. Owner shall not pay any other amount except the agreed O&M charges.

Operation & maintenance of evacuation system up to the point of interconnection with the State grid shall be the responsibility of the O&M Operator. In case of any outage of external lines connected with the wind farm, the Operator shall follow up with GETCO / DISCOM for prompt restoration of the faulty line under intimation to Owner.

6.3 SCOPE OF WORK

The Scope of Work for O&M Contact shall include but not limited to the following: -

1. Supply of spares
2. Consumables
3. All Statutory compliances as applicable at the time of bidding.
4. Arrangement of Tools
5. Arrangement of Tackles
6. Crane Management
7. Testing
8. Liaison with all Government agencies
9. All administrative work
10. Maintaining records and submissions to all concerned authorities
11. Security

12. Coordination with the required agencies for revenue realization

The detailed scope of work is given in section VII & VIII

Cost of all the above items shall be included the price quoted for price bid of solar and wind power plant separately.

Operator shall provide all day to day operation and maintenance services for the hybrid energy project as set forth herein. Operator shall perform the work and arrange/supply all required spare parts, cranes, special tools & tackles or any other items as may be required, in a prudent and efficient manner and in accordance with manufacturer's and systems designers' specifications, Annual Operating Plan for the Plant and O&M manuals.

All applicable laws of the land including environmental protection, pollution, sanitary, employment and safety laws, ("Government Rules") shall be complied.

6.4 PRUDENT UTILITY PRACTICE

Operator shall use all reasonable and practical efforts:

- To maximize plant capacity utilization
- To minimize plant downtime
- Optimize useful life of all the equipment of the wind & solar energy project.

The Operator shall perform the following obligations prior to taking over of the O&M activity:

- Prepare Mobilization plan in consultation with the Owner
- Provide the services and personnel set forth in the Mobilization Plan
- Prepare in consultation with the Owner, the initial Annual Operating Plan
- Develop and implement plans and procedures including those for firefighting, maintenance planning, procuring and inventory control of stores and spares, plan to meet emergencies, plant safety and security; and such other facilities and systems as may be necessary to commence Operator's ongoing responsibilities.

After taking over the activity of O&M for the power plant, the Operator shall be responsible for the operation and maintenance of the plant and shall perform all necessary services including applicable services listed below: -

i) Provide all operations and maintenance services necessary and advisable to efficiently operate and maintain the plant, including all associated and appurtenant mechanical and electrical equipment keeping in view the objectives set-forth herein above.

ii) Maintain at the Plant accurate and up-to-date operating logs, records and Monthly reports regarding the operation and maintenance of the Plant which shall include detail of power output, other operating data, repairs performed and status of equipment, all such records to be maintained for the lifetime of the hybrid project. Upon expiry of term, the operator shall hand over such records to the Owner. However, Owner shall have access to all such records at any time.

iii) Regularly update and implement equipment repair or replacement and preventive maintenance program that meet the specifications of the equipment manufacturers

and the recommendations of the original equipment manufacturers.

iv) Perform periodic preventive maintenance and overhauls required for the Plant in accordance with the recommendations of equipment manufacturers. Attend any break down in the Plant/Facility promptly. Inform time taken in attending to such breakdown shortly after restoration of wind and solar power plant.

v) Provide technical & engineering support for resolving operation and maintenance problems.

vi) Perform the services required to procure all spare parts, or equipment/s as required, overhaul of parts, tools and equipment, required to operate and maintain the Plant in accordance with the recommendations of individual original equipment manufacturer.

vii) Operate and maintain the Plant for fire protection and safety of equipment. Fire protection here means that the contractor shall provide all necessary equipment for protection of complete hybrid power plant & balance of plant against fire.

viii) Maintain with the assistance of the Owner, records regarding the facility in accordance with prudent industry practices.

ix) Arrange spares, consumables, tools & tackles, crane and testing. Cost of these items shall be included in the price quoted for O&M.

6.5 PERSONNEL

The Operator shall employ adequately qualified and experienced personnel for operating and maintaining the wind & solar energy project. The Operator shall ensure that such personnel remain on duty at the plant at all times, twenty-four (24) hours a day and seven (7) days a week soon after commissioning of the first WEG and solar string as the case may be. The detailed site Organogram with name and qualification / experience of the staff should be submitted to OIL.

6.6 LEVY OF REACTIVE POWER (KVARH) CHARGES

In the event of levy of any charges by State grid on account of reactive power such charges at actual amount shall be deducted from the operator's bills / outstanding operator's credit amount.

6.7 LIAISONING

It shall be the responsibility of the Operator to liaison with the State Government, concerned Renewable Agency, State Transmission & Distribution Companies, REMCL, CEIG or any such agency / department which may be required for expediting the project.

6.8 O&M PERFORMANCE GUARANTEE

The Bidder shall submit a Bank Guarantees in following manner as per clause nos. 2.29.2 (ii), (iii) and (iv) of SECTION-II.

Respective BG(s) shall be returned in event of submission of next BG.

Such Bank Guarantee shall be given in the Performa as per Annexure – III.

6.9 INSURANCE BY OIL

Insurance policy for Fire and allied perils including earthquake, flood, storms, cyclone, tempest, theft and burglary, and any other purpose, as deemed fit by OIL, shall be taken

by OIL regularly during O&M contract period. In case of any loss / claim covered under the policy, O&M contractor shall immediately inform the same to OIL & **facilitate OIL in filing the claim with Insurance Company.** Thereafter, Contractor shall submit all required documents to OIL for onward submission to Insurance Company for filing claim and take all necessary measures required to protect the interest of OIL for settlement of such claim.

The Contractor shall replace the damages to equipment which occur on account of events covered under such Insurance Policies, without waiting for settlement of the insurance claim, on the basis of estimation duly approved by OIL. OIL shall issue LOA / PO, wherever applicable, to go ahead and carry out repairs / replacement. On settlement of such claims by the Insurance Company, OIL will bear the additional cost of replacement / repair over and above the insurance claim settled. In the event of rejection of the above claim by Insurance Company, the entire replacement / repair cost will be borne by the Contractor and the amount, if any, given by OIL for repair / replacement will be refunded back by the contractor.

In case of claim against fire (not attributable to Force Majeure), theft & burglary, OIL shall only reimburse to the contractor to the extent claim received from the Insurance Company and the differential cost of replacement / repair over and above the insurance claim settled, if any, will be borne by the Contractor. In the event of rejection of the above claim by Insurance Company, entire replacement / repair cost will be borne by the Contractor

By Bidder

Bidder shall provide or obtain and maintain in force throughout the period of contract the following insurance coverage:

- Insurance to cover third party liability along with an undertaking indemnifying the Owner from any such claim.
- Workmen compensation and /or group personal accidents Insurance policy covering all its employees and works including the sub-contractor.
- Contractor shall also affect and maintain any and all other insurance, which he may be required under any law or regulation or practice from time to time.
- The Contractor may or may not take MBD insurance policy but it would be the responsibility of the Bidder to operate and maintain the wind farm and all the associated equipment at his own cost during the entire O&M period for which OIL shall pay the agreed O&M charges only. Any replacement / repair / modification of any item / equipment shall be carried out by the Bidder at his own cost during the entire O&M period, so as to have minimum machine down time. OIL shall not be responsible for any break down / failure of any equipment due to any reason thereof except for Force Majeure / Fire & Allied Perils Events or extraneous reasons. In the case of any delay/ lapse on the part of O&M Contractor in restoring the operations beyond the time periods to be finalized with the successful bidder before signing of the O&M contract, the loss in generation would be charged to the O&M Contractor.
- The Contractor shall take all pre-cautions to prevent fire of any nature in the area of jurisdiction of his operations and in case of any losses arising out of such accidents,

due to negligence on the part of the Contractor or Sub contractor, has to be borne by the Contractor.

- The contractor shall replace the damaged equipment without waiting for settlement of insurance claim. In the case of any delay / lapse on the part of O&M Contractor, the loss would be made up by them.

6.10 MEASUREMENT OF ENERGY AND METERING

6.10.1 Metering Systems:

The Operator shall maintain the Metering System (which shall include ABT / TOD IEGC compliant meter, current and potential transformers and metering equipment). The Metering System will be designed and installed conforming to requirements of State utility so as to measure outgoing energy and power delivered by the hybrid power project to the ISTS/InSTS at the delivery point, i.e. point of inter connection and also for the import of energy for any purpose. Metering equipment shall comply with the requirements of State Utility Grid Code but shall not be inferior to 0.2 accuracy Class. Meter reading shall be done jointly with Power Utility Engineer on monthly basis or at mutually agreed time interval. The meters should be compliant to data transfer to SLDC as per their requirement.

In addition to above separate metering system for wind power plant and solar power plant to pooling substation

6.10.2 Testing of Meters

The Owner shall have the right to carry out inspections of the Metering Systems from time to time to check their accuracy.

All testing and metering equipment shall conform to the relevant IS / TRANSCO / DISCOM standards.

If either the Operator or the Owner finds any inaccuracy in the Metering System, the operator or the Owner, as the case may be, shall notify the other party in writing within 24 hours for a joint inspection and testing from GETCO/DISCOM/ or other concerned agency.

6.10.3 Sealing and Maintenance of Meters

The Metering System shall be sealed in the presence of both parties or in the presence of DISCOM's Engineer.

When the Metering System and/or any component thereof is found to be outside the acceptable limits of accuracy or otherwise not functioning properly, it shall be repaired, re-calibrated or replaced by the Operator on priority. The cost for the same shall be on Operator's account.

Breaking of meter seals shall not be done except in case of any requirement by State power utility for testing/calibration. Even in such case the Operator shall immediately inform the Owner of such requirement to enable Owner for deputing its representative. All testings/calibration of metering system shall be done by State power utility officials only. The cost for the same shall be on Operator's account.

6.11 O&M CHARGES

The Operator shall be responsible for Comprehensive Operation and Maintenance of the wind power project for a period of twenty (25) years from the date of stabilization of the complete hybrid project i.e. wind and solar project whichever is later.

Payment will be made after all statutory deductions as applicable to such type of contracts. The rate quoted shall deem to be inclusive of all salaries and other cost, expenses of employees, cost of spares, cost of repair / replacement / modification of any equipment or system for the entire period of 25 years so as to give 96% machine availability for 25 years and performance ratio as quoted/agreed. The rates shall also be inclusive of tools & tackles, etc. and liabilities of every description and all risk of every kind to be taken in operation, maintenance and handing over the plant to the Owner by the operator. Owner shall not be responsible for any such liability on the operator in respect of this contract and exclusion of applicable taxes on the Bid Closing Date and Time prescribed rates due to ignorance or otherwise shall not form a reason for claiming anything extra at a later date. If any amount is payable / levied to/by GETCO / DISCOM, etc, on account of low power factor or any other account of wind farm, the same shall be deducted from the operator's remuneration or from other due payments/Bank Guarantees.

Subsequent to the date of submission of offer by the Contractor, if there is a change in taxes, regulations, levies, which results in additional cost/ reduction in cost to the Contractor on account of the operation under this contract, the Company / the Contractor shall reimburse / pay the Contractor / the Company for such additional / reduced cost actually incurred.

6.12 PAYMENT

Payment period shall be on quarterly basis at the end of each quarter. The operator shall submit bills in respect of the quarter ended in quadruplicate after the end of each quarter for the payment after submission of PBG as per Clause No. 6.8. Quarterly payment will be released on production of the following documents:

- Record of major components / sub-systems repaired or replaced during the quarter.
- Record of preventive maintenance carried out by the Contractor during the quarter and preventive maintenance plan for next quarter.
- Statement of month wise charges billed by the utility for reactive power drawal along with documentary evidence. Payments would be released after adjustment of the same from the payable amount
- Working of monthly machine availability for each WEG with details of schedule and breakdown maintenance hours duly certified by the O&M in-charge.
- Working of monthly performance ratio/solar system availability for solar power plant with details of schedule and breakdown maintenance hours duly certified by the O&M in-charge.
- Working of Transmission losses on monthly basis in each Quarter. If the actual annual transmission losses are more than guaranteed then payments would be released after necessary price discount as per terms of contract.
- Other reports mentioned in Scope of work like Breakdown details along with remedial actions taken, Break up of down times – Technical & Non-Technical, Error trend, Component failure details, ROW – Reasons & remedial actions taken

- Working of Grid availability monthly / quarterly along with monthly statement of grid failure hours, load shedding hours caused by (on account of) GETCO for the quarter, based on the SCADA / log book records at GSS, certified by O&M site in-charge of the contractor
- Compliance of various rules regulations, grid code and scheduling & forecasting without any UI penalties on OIL for each quarter.
- A certificate for compliance to the existing laws for employment of the manpower (wage sheet, PF statement, Pension fund statement etc.) and payments for statutory taxes and duties.

6.13 SUBMISSION OF DAILY & MONTHLY GENERATION DATA STATEMENT

A daily report comprising energy generation, average wind speed, solar irradiation, grid availability, breakdowns, generation hours, low wind hours, low solar isolation hours, machine availability, solar system availability etc shall be sent through e-mail and /or made available through Customer Relation Manager (CRM) to Owner.
Monthly Generation data statement for net energy delivered to the Utility duly certified by their authorized official shall be furnished to Owner by the Operator not later than 10th day of the following month/ as per state utility practice.

The Operator shall coordinate with the DISCOM's/required agencies for revenue realization.

6.14 OPERATOR'S OFFICE AT SITE

During the execution of the O&M contract, the Bidder shall ensure responsible person with authority to take decisions to be available at site(s)/site office. Such person deputed by the Contractor shall report to the Owner's/Consultant's Site in-charge, for smooth operation and timely addressing of breakdown. The Contractor shall also provide and maintain a site office, at the site, for the use by the owner / its consultant / representative. Such office shall be open at all reasonable hours to receive instructions, notices or other communications. The Contractor shall be responsible for any misconduct/indiscipline by his employees or sub-Contractor/agent employee's. The Contractor shall abide by the instructions of the engineer in charge, if given in this regard. Contractor shall construct a dedicated store room to maintain minimum spares required for 2 years. List of spares available in the stores is to be shared with OIL on monthly basis

6.15 POWER OF ENTRY

In case the Operator does not execute the work in the manner described in the contract documents or if he shall at any time in the opinion of the Engineer-in-Charge:

i) Fail to operate & maintain the plant in conformity with contract document or

ii) Substantially suspend work or the works for a continuous period of 15 days without permission from the engineer in charge, or

iii) Fail to carry on and execute the works to the satisfaction of the engineer in charge, or

iv) Commit or suffer or permit any other breach of any of the provisions of the contract on his part to be performed, or

v) If the operator abandons the works, or

vi) If the Operator during the continuance of the contract becomes bankrupt.

In any of such events, the Owner shall have the power to enter upon the works and take possession of the plant, materials, spares, equipment, tools and stocks thereon, and to revoke the Operator's license to operate the plant by his agents, other Operators or workmen.

6.16 **HANDING OVER THE PLANT AFTER EXPIRY OF TERM**

In the beginning of last year of expiry of term & extension of term as the case may be, the operator shall hand over the plant to the Owner in operationally fit and running condition. The operator shall demonstrate 96 hrs short run test of all WEGs and demonstrate performance ratio test along with the associated major & critical equipment to ensure that plant is operational and in good running condition in accordance with the norms of original equipment manufacturer. While handing over the plant, the operator shall hand over all technical documents, literature, and instruction manuals, all spare part & tools & tackles alongwith the list of the same. The Operator will also hand over all the relevant record/documents.

6.17 **DEFECTS / NON-ACHIEVEMENT PLANT DEPENDABLE CAPACITY AFTER HANDING OVER**

In order that the Operator could obtain a Handing Over certificate, he shall rectify any defect / non achievement of plant dependable capacity in accordance to the norms of manufacturer arising from the defective Operation & maintenance practices or noncompliance of Prudent Utility Practices or that may have been noticed or developed during/ after the plant has been taken over, the period allowed for carrying out such works will be normally one month. If any defect could not be remedied or plant dependable achievement capacity in accordance to the norms of manufacturer could not be achieved within a reasonable time the Owner may proceed to do the work at operators' risk and expense and deduct from the final bill such amount as may be decided by the Owner.

All the aforesaid safeguards /rights provided for the Owner shall not prejudice its other rights/remedies elsewhere provided herein and/or under law.

6.18 **Maintenance of Common Facilities**

Bidder or its associate company to operate and maintain the Common Facilities for the Life of the Hybrid power plant in accordance with its Operating and Maintenance protocols.

6.19 **SCHEDULING & FORECASTING**

Scheduling and forecasting process is now required to be implemented in the Renewable Energy Sector as the Central Electricity Regulatory Commission (CERC) have notified a Regulation named Indian Electricity Grid Code Regulations (IEGC), 2010 on April 28, 2010 for helping and maintaining the Grid discipline and also formulate rules related to the operating parameters of the Indian Grid across the country. CERC has also issued IEGC Regulations, 2010 under clause (h) of subsection (1) of Section 79 read with clause (g) of sub-section (2) of Section 178 of the Electricity Act, 2003. As per CERC Order dated 16th January, 2013 the implementation date has been fixed as 1st July, 2013.

GERC vide their order dated 19.01.2019 has notified that Deviation Charges specified in

the Regulations shall be effective from 1st August, 2019. As specified elsewhere in the Contract documents, to comply with statutory requirements, Regulations, Orders, Bidder would be responsible for scheduling and forecasting for the ordered capacity on behalf of the Owner.

The Operator shall appoint a QCA for the same. However, if OIL so desire, they can also appoint QCA directly and in that case all the required data, information should be timely provided to them to provide scheduling & forecasting correctly & efficiently and bidder shall not claim any charge on account of providing data and connectivity. The Operator shall not be responsible for any financial implication arising out of DSM mechanism. Operator shall provide Communication Connectivity of pooling station to GETCO/SLDC, QCA for the purpose of scheduling & forecasting. For any DSM penalty incurred for non-receipt of generation schedule from Operator's end, such penalty will be recovered on actuals from the Operator.

B. Provision specific to wind portion of project

6.20 MACHINE AVAILABILITY

6.20.1 Operator shall maintain all the WEGs of the wind power project in a befitting manner so as to ensure minimum machine availability as defined in the clauses hereunder and elsewhere in the document.

6.20.2 The Operator shall keep average minimum machine availability for the Wind farm at not less than 70% during stabilization period of two months.

6.20.3 The Operator shall keep yearly average minimum machine availability of the Wind farm at not less than 96%

6.20.4 The operator shall guarantee for above minimum Machine Availability. The machine availability includes power evacuation system (up to interface with the State Grid).

6.20.5 In case the Machine Availability is found to be less than as stated above then the Operator shall pay to the Owner Pre-determined Mutually Agreed Compensation as given at Clause No. 6.8.1 of this Section.

6.20.6 For working out of Annual Average Machine Availability (M.A) of the wind farm following formula shall be considered Annual Average M.A of the wind farm shall be calculated in the following manner:

$$\text{Annual M.A for each WEG} = \frac{\{8760 - (GF + FM + S + U)\} \times 100}{\{8760 - (GF + FM)\}}$$

$$\text{Annual Average M.A of the wind farm} = \frac{\text{Sum of the annual M.A calculated for each WEG}}{\text{No. of WEGs installed at site}}$$

Where, Recorded Hours = {8760 – (GF + FM + S + U)}

8760 = Number of total hours for a machine in a year (i.e. 24x365 Days)

GF = Grid Failure hours, FM = Force Majeure hours

S = Scheduled Maintenance Hours for a Machine

U = Unscheduled or Forced Maintenance Hours for a Machine

6.21 **GUARANTEE FOR MAINTAINING POWER FACTOR AND DRAWAL OF REACTIVE POWER**

6.21.1 **Power Factor**

It will be the responsibility of the Operator to maintain power factor of the wind farm not less than the minimum requirement of GETCO / DISCOMs so as to minimize drawal of Reactive Power from State grid system.

6.21.2 **Guarantee for Transmission Losses**

Total Annual Average Losses in evacuation system of electricity from LCS to the point of interfacing including import of energy shall be guaranteed by bidder & same will be considered during estimation of Annual Energy Production.

Excess losses than the guaranteed above will be payable by Operator to OIL at 100% of the PPA rate entered with REMCL. Such loss will be recovered on annual basis

C. Provision specific to solar portion of project

6.22 **Guaranteed Generation & Performance Ratio**

6.22.1 Bidder are expected to make their own study of solar profile and other related parameters of the area & make sound commercial judgment about Performance Ratio (PR) to determine the Annual power output i.e. Annual Energy Production of the plant. It shall be the responsibility of the bidder to access the corresponding solar insolation values and related factors of solar plant.

6.22.2 The bidder should quote 'Net Electrical Energy Generation Guarantee (NEEGG)", Performance Ratio (PR)" and annual degradation in BRS 10

6.22.3 The bidder shall be required to install energy meters to record the Net Annual Energy Production (AEP) from the Solar Plant (Energy generated and exported from solar plant – Energy Import from system)

6.22.4 Necessary corrections may be carried out by the Owner or its Consultant, if required, in the AEP furnished by bidders.

6.22.5 The corrected figure for AEP shall be considered for evaluation of bids. The same has to be ratified by the bidder.

6.22.6 The Successful bidder shall be responsible for achieving the NEEGG and Performance Ratio. For any shortfall in achieving the NEEGG and Performance Ratio (PR), the compensation shall be recovered from the successful bidder on annual basis. The successful bidder has to maintain the Solar Plant equipment(s) including its repair, replacement, overhauling, etc, so as to give the agreed Performance Ratio per year, for which OIL shall pay the agreed O&M charges only and no other charge / cost is payable by OIL.

6.22.7 In case the net exported energy recorded is less than AEP, then bidder shall be allowed to relocate the solar modules and install at different places at their own cost ensuring NEEGG and Performance Ratio. The entire cost including cost of land, dismantling and re-erection, etc. shall be borne by the bidder. To ensure Performance Ratio, the bidder shall also be allowed to erect additional number of solar modules without extra cost to OIL.

6.22.8 The performance of Solar Power Project shall be evaluated on annual basis. In case of shortfall in quoted NEEGG and Performance Ratio compensation shall be recovered as per compensation clause no 6.25

6.22.9 The Company reserves the right to perform random audits of weather monitoring system of the plant anytime during the entire O&M period. If any discrepancy is found between the measured parameters, the difference between the measured parameters by OIL from secondary sources and the weather monitoring system installed by the Contractor at the site will be factored in calculating the adjusted PR during the entire year. However, OIL will have the final authority to decide on this matter

D. Price discount in event of non-achievement of agreed CUF

6.23 SHORTFALL IN GENERATION OF HYBRID PROJECT

During PPA, if for any year, it is found that the Project has generated energy less than 80% of the CUF committed to REMCL by OIL, which can be revised once in first three years of operation from the date of commissioning, such shortfall in performance shall make the Bidder liable to pay the compensation to OIL as claimed by the REMCL from OIL, on back to back basis.

If this compensation is more than the compensation recovered due to non-fulfilment of the requirements of machine availability, Performance Ratio and transmission loss then the differential amount payable to REMCL will be recovered by OIL from the contractor.

During the first three years of operation after commissioning, OIL in consultation with contractor may decide to revise the CUF (not less than 30%) to be committed to REMCL for balance years. The annual generation will not be lower than the accepted AEP considered for financial calculations for IRR. However, if reduction in annual CUF to REMCL results in reduction of IRR then Contractor shall provide price discount, to be decided mutually to mitigate the reduction in envisaged returns (IRR) of the hybrid project.

6.24 FOR WIND PRRTION

6.24.1 PRE-DETERMINED MUTUALLY AGREED COMPENSATION

In case the machine availability is less than minimum guaranteed value, Contractor shall pay compensation to OIL in the following manner:

(i) Stabilisation period

In case annual machine availability of wind farm is less than the minimum guaranteed value of 70%, the Contractor shall pay compensation to OIL in the following manner:

COM = [(70- MAF) x C x D]/100

Where,

COM is compensation in INR payable to OIL,

MAF is machine availability factor as calculated in Clause 6.6.8

C is 110 % of tariff given in PPA agreed with REMCL

D is actual generation of saleable energy in kWh of the WEG during the year

Machine availability during the year shall be maintained at 96%.

(ii) In case machine availability of wind farm during this period is less than the minimum guaranteed value of 96%, the Contractor shall pay compensation to OIL in the following manner:

COM = [(96 - MAF) x C x D] /100

Where,

COM is compensation in INR payable to OIL,

MAF is machine availability factor as calculated in Clause 6.6.8

C is 110 % of tariff given in PPA agreed with REMCL

D is actual generation of saleable energy in kWh of the WEG during this period

6.25 FOR SOLAR PORTION

6.25.1 Penalty for Loss of Generation During 1st year of O&M

For 1st Year, the Contractor shall demonstrate "Actual Delivered Energy" at the Metering Point as compared to the 'NEEGG' for the 1st year.

At the end of the first year, if the plant failed to achieve the NEEGG than

The bidder shall compensate as follows:

Guaranteed NEEGG: A

Achieved NEEGG: B1

Shortfall in 1st Year: C = A-B1

% Shortfall in generation in first year, R =C/A

To calculate shortfall in generation from 2nd year till 25th year the same will be calculated by multiplying the quoted generation for the year by R i.e % shortfall in first year

T= Total shortfall for 25 years to be calculated by adding annual shortfall for each year as found above

Compensation: T X PPA Tariff X 1.10

6.25.2 Penalty for Loss of Generation from 2nd year of O&M

Bidder shall quote Performance Ratio (PR) not less than 75%. The Performance Ratio will be calculated as per Annexure V

Compensation on Performance Ratio (PR) from second year:

In case the PR is less than the PR quoted by the bidder, the compensation will be calculated as follows:

PR quoted by the bidder = A

PR achieved at the end of the second year = B

Difference of PR, C = A-B

Actual generation achieved at PR @B: G

Anticipated generation at PR A: G1 = G + G * C

Differential generation in units, D = G * C

Compensation amount = 1.1 X PPA Tariff X D

The same method will be applicable for calculating compensation 2nd year onward till the 25th year.

6.26 **RECOVERY OF PRICE DISCOUNT**

The price discount will be calculated annually based on guaranteed performance.

The above Compensation will be deducted from price of Comprehensive O&M payment or bidder can reimburse the same to OIL else will be recovered from the O&M Security Deposit.

The total combined Compensation on account of shortfall in machine availability (COM), Performance Ratio and on account of transmission loss shall be limited to 100% of annual O&M contract value for that year.

Any Compensation arising out of guarantees during O&M period shall be adjusted against the O&M charges to be made to the Bidder.

6.26.1 In case the Project fails to generate any power continuously for 6 months any time during the O&M period, it shall be considered as an “Event of Default”.

6.26.2 Upon occurrence of any Event of Default mentioned in Clause 4.17 herein above, OIL shall have the right to encash the entire amount of O&M Bank Guarantee submitted by the Contractor and withheld any other pending payment.

SECTION–VII

SCOPE OF WORK (WIND)

SECTION– VII A & B

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Clause No.	Description
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7.14	OPERATION & MAINTENANCE
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SECTION– VIIA

SCOPE OF WORK

SUPPLY, ERECTION & TESTING

The Scope of Supply covered under this specification shall be but not limited to the following: -

7.1 **DESIGN, MANUFACTURING & SUPPLY**

Design, engineering, manufacture, in house testing and supply at site of suitable low voltage, 50 Hz, upwind / downwind, horizontal axis Wind Electric Generators (WEGs) in the range of 1500 kW and above rating complete with accessories as may be required for erection, commissioning and successful continuous operation of 41(+5%) MW capacity wind energy farm with the State grid. The WEGs shall be equipped with current limiting devices and capacitors (in case of induction generators) so as to maintain power factor conforming to the requirement of State grid.

Bidder shall ensure compliance with the requirements of “Indian Electric Grid Code” 2010 notified by CERC

The offered model of WEG should be compliant to fault ride through (FRT), Low Voltage Ride through (LVRT) requirements.

Design, engineering, manufacture and supply at site(s) of towers suitable for WEGs.

Design, engineering, manufacture and supply at site(s) of wind farm internal electrical system.

Design, engineering, manufacture and supply at site(s) of Grid interfacing equipment including transformers, HT lines, panels, kiosks, protection equipment, metering equipment for evacuation of power from the wind power plant to the nearest State grid

sub-station.

Design, engineering, manufacture and supply of ABT type meter(s) for recording data regarding export and import of power to/from State grid and also recording KVAH & KVARH data on real time basis.

Design, engineering, manufacture and supply of VAR drawl compensation system, if required.

Design, engineering, manufacture and supply of all control system to give command to WEGs, receive data, processing and getting required report on energy generation, wind speed etc.

Design, engineering, manufacture and supply Centralized Monitoring and Control System (SCADA) on sharing basis for Owner.

Design, engineering, manufacture and supply of any item not specified but essential for the wind farm.

Bidder is to maintain adequate spares required for 2 years at site for smooth operation & maintenance of wind energy project. List of such spares to be provided.

7.2 WIND MONITORING MAST

The bid shall include supply, installation and maintenance of one wind monitoring mast (meteorological mast) at the offered site. The wind mast shall be maintained and kept operational till completion of defect liability period. Wind mast shall include all required data loggers, sensors etc. capable of recording data for a minimum of10 minute intervals. Wind measuring system should be 16 quadrant types and of approved / accredited makes. The height of the wind mast shall be such that primary anemometer is mounted at the same height/level as that of centre of rotor of the WEG under test. Wind wane shall be mounted at a minimum of 1.5 m below the primary anemometer but within 10% of hub height based on its distance above ground level at the wind mast. It shall be mounted so that flow distortion effects are minimized. Temperature and pressure sensors should be located close to the hub height on the wind mast at a minimum of 1.5 m below the primary anemometer. If a control anemometer is used it should be located close to the primary anemometer in order to provide good correlation between the two instruments. Necessary instrumentation for measurement of instantaneous wind speed, direction of wind flow, atmospheric pressure& temperature and RH should be installed. Raw wind data for continuous one year shall be gathered by the wind mast. The raw wind data and wind frequency distribution for this period shall be given to OIL on monthly basis and for the full year as well.

Installation & commissioning including stabilization of wind mast shall be done before 30 days of start of power curve testing. and data collection by wind mast should start soon after commissioning.

The monitoring wind mast can be a new wind mast in the wind farm (of OIL) or the wind mast installed for the purpose of Power Curve Performance Test or the existing wind mast if the same is within the wind farm. In all the cases measuring equipment including sensors should be freshly calibrated.

7.3 DOCUMENTS & DRAWINGS

7.3.1 Following documents in three copies each shall be submitted to Owner as well as Consultant for review and approval:

Detail Technical Specifications.

General Arrangement Drawing.

Contour plan for the land area.

Micrositing plan & wind farm layout.

Layout diagram of the WEG protection system and control system

Schematic diagram for entire evacuation system and transmission loss calculations.

G. A. drawings for overhead lines along with all types of structures, 33kV switchyard & Interfacing.

Quality Assurance Plans.

Copies of type test certificates along with test reports, routine and acceptance tests for major components.

7.3.2 Submission of all the drawings on "as built" basis covering all changes/modifications, if any, due to site(s) conditions in four sets to Owner/Consultants after commissioning of the project for record purpose.

- One soft copy of as built drawings shall also be submitted.
- O & M Manuals in four sets.

7.3.3 The Contractor shall forward to Owner/Consultants Schedule of supply within a week's time from the date of Award of Contract.

7.4 LAND, LAND DEVEOPLMENT & LAND TRANSFER

7.4.1 Arrangement of suitable & adequate land, government/forest land on lease/sublease basis or private land on the ownership basis and transfer on ownership/lease to OIL India within six (6) months of LoA. The land should have clear title and free from all encumbrances, charges and liens, encroachments or litigation and beyond the purview of land acquisition for any other purpose. In case of leasing of private land, the minimum lease period shall be 30 years in the name of the OIL India. In case of leasing of Government land, appropriate state regulations regarding tenure of lease agreement shall be applicable. In both cases, the lease agreements should have the provisions to be extended, if required.

7.4.2 In case of re-location of WEGs due to any reason beyond control of the bidder the Bidder shall relocate all such WEGs at other mutually agreed location resulting in a manner that AEP at the mutually agreed location shall not be less than the original locations mentioned in the letter of award at his own cost and peril. However, compensation if any imposed by SECI in lieu of this will be at Bidders account.

7.4.3 Acquisition and transfer of ownership of Land and/or Right of Way/Use for Land required for

i) Installation of 41MW (±5%) Wind Energy Project & 14 MW solar Project for power generation in the State of Gujarat and

ii) Construction of internal roads required for smooth & trouble-free O&M

iii) Construction/development of proper approach roads to the project site

iv) Approach roads can be on sharing basis but bidder will furnish documentary proof showing that land for such approach roads belongs to him or he has the Right of Way/Use.

v) Setting up T&D network, transmission lines, transformers and evacuating the power generated from wind turbines up to the nearest GETCO Grid as point of interconnection

7.4.4 Arranging necessary statutory approvals & permissions from the concerned departments/authorities required for above. Bidder shall furnish copies of Govt. Policy (ies) applicable/in force for acquisition & transfer of land applicable to wind energy projects for the type of land offered.

7.4.5 All expenses required to be incurred for the above including statutory fees, stamp duty, logistic expenses etc. shall be borne by the bidder/contractor.

7.4.6 Technical Requirements of the offered Land

The land offered by the bidders should meet the following requirements

(a) Only those sites shall be accepted where wind resource assessment (WRA) has been carried out by installing wind mast of preferably 80 Meter height of WEG offered and measurement of wind-data for at least continuous one-year period as per established industry practices/MNRE/NIWE/State nodal agency guidelines. The sites should have authentic wind resource assessment data to ensure estimation of long-term energy output from the wind-farm and meeting the techno-commercial viability of the project.

(b) It is desirable that the bidder furnishes wind-data and energy output records of adjacent wind-masts or wind farms during recent years to Owner during energy estimation validation to be submitted in the bid for correlation of data with the offered wind farm.

(c) Land for solar plant & wind plant should be adjacent to each other as both has to be connected at same pooling station

(d) The farthest wind turbine of wind farm in the offered land shall not be more than 10 km from the reference wind mast to enable Owner carry out prediction of estimated energy yield of the offered wind farm for long term basis with reasonable accuracy.

(e) In case of land purchased on foot print basis, developer shall leave minimum distance of ½D+5m as boundary distance from the Centre of the proposed WEG from the neighboring land.

(i) Boundary distance of 0.5D + 5m in all four directions from the WTG (where D is the WTG rotor diameter) if there is no building, school, residential place etc nearby.

(ii) Boundary distance of Tower height + 0.5D + 5m in all four directions from the WTG (where D is the WTG rotor diameter) if location is nearer to building, school, residential place etc.

(iii) In case of revenue / forest land as per Government policy in force.

7.4.7 Legal Requirements of Land

There could be three types of land for development of hybrid project i.e. (i) Private Land; (ii) Revenue (or Government) Land & (iii) Forest Land. Bidder can offer for any of the land for the project. Transfer of land shall require to be done depending upon of type of land offered by Bidder in the following manner

(I) Private Land

Private land, if offered, should have clear title and should be transferable to Owner. The Bidder shall furnish the following documents along with the bid:

i) Agreement to sell / Agreement to Lease of the offered land with the actual land owner.

ii) An appropriate extract of Government land record showing details, such as the name of owner(s), identification of the piece of land, type of land, area, details of tax paid etc. in respect of the offered land.

iii) An undertaking on a non-judicial stamp paper of requisite value stating that in the event of Award of Contract by Owner to the Bidder, land shall be transferred to Owner, without any other consideration free from all encumbrances.

iv) In case the Agreement to Sell / Agreement to Lease is executed with an agency other than the Bidder, then the development agreement/MOU between the Bidders and the land supplying agency shall also be submitted.

The successful bidder shall be required to ensure the following while transferring land in favour of Owner:

i) The seller from whom the Bidder/Bidder's nominee/3rd Party is buying the land has a clear title to the said land

ii) Validity of the said Agreement to Sell shall be maintained or extended, if required, at least up to the validity of the Bid and it must also provide reasonable time for executing sale Deed with OIL from the Letter of Award (LOA).

iii) Agreement to sell should provide that the Sale Deed will be executed and duly registered in favour of Bidder or Bidder’s nominee.

iv) The land use in the records/policy of the Government does not prohibit the purpose for which the land is being procured i.e. setting up of a hybrid power project and allows change of land use for allowing setting up of a hybrid power project.

v) All taxes, legal dues, charges, incidental/logistics expenses etc. for the said land applicable up to the period of execution of Sale Deed in favour of Owner by the Bidder shall be duly paid to the concerned Authority by the Bidder.

vi) Obtain permission of competent authority for Non-Agriculture (NA) use of agriculture land for hybrid power project.

(II) Revenue Land (Govt.) Land:

In case the offered land is Government land for which requisite amount has been deposited to Revenue department / Nodal Agency by the Bidder or its subsidiary or Bidder's group company & suitable agreement is signed between the District Collector & the Bidder or its subsidiary or Bidder's group company or official Letter of Allotment from State or its agency is issued, then land should be sub-leased for at least 25 years or as per State Government policy from the date of commissioning

If the land has been allotted to a third party with whom the Bidder has signed an Agreement to Transfer such land to Oil India Limited without consideration, then the land should be subleased to Oil India Limited for at least 25 years (or as per State Government policy) from the date of commissioning. The bidder is responsible for completing the formalities and ensuring the sublease in name of Oil India Limited. Transfer/sublease in the name of Oil India Limited shell be done as per state policy.

If Allotment Letter of competent authority is not available the recommendation of allotment of offered land from the Nodal Agency will be considered subject to submission of Allotment Letter of competent authority within 60 days of Techno-commercial bid opening.

(III) Forest Land:

The bidder must have at least Stage-1 clearance of the offered forest land from Ministry of Environment and Forests as on the bid submission date. The Bidder shall be required to fulfil/comply all the requirements mentioned by MoEF in Stage-1clearance and obtain Stage-2 clearance within a period of 4 (four) months from the date of opening of Techno-commercial bid.

Lease transfer of the forest land in favour of Oil India Limited shall be got done for a period of 25 years or as per the conditions laid down by MoEF while according clearance of the land.

In case of Forest land the lease transfer shall be for balance period as available with the bidder at the time of lease transfer which shall be more than 25 Years

7.4.8 Bidder shall indicate minimum area of land for installation of each WEG and solar project as well as for approach road etc. The approximate area of land of the hybrid project to be transferred/sub leased/leased /transfer - to Oil India Limited is to be indicated in the offer irrespective of the type of land offered.

7.4.9 Bidder shall indicate area of land offered for solar project.

7.4.10 Approach road may be on sharing basis but bidder will give documentary proof showing that land for such approach road belongs to him or have right of way.

7.4.11 Building of approach roads to hybrid power project and internal service roads

7.4.12 Land development activities, obtaining all clearances related to land development, civil works including administrative building having control room, store, office, amenities, water arrangement, extensions etc.

7.4.13 To comply with all the rules and regulations already in force and formed by the statutory and local bodies notified from time to time effective at the time of submission of bid. In case change /new in statuary charges imposed after submission of bid same will payable by Owner.

7.4.14 Obtain permission of competent authority for Non-Agriculture (NA) use of agriculture land for hybrid power project.

7.5 STATUTORY APPROVALS

Obtaining statutory approvals / clearances, wherever required, from Government departments but not limited to the following:

- Airports Authority of India
- Pollution Control Board
- State Renewable Energy Development Agency
- State Power Utilities viz. Transmission Company / Distribution Company
- Electrical Inspectorate (CEIG)
- Forest Department and
- Arranging PPA with State DISCOMs
- Other applicable permissions / clearances relevant for the offered site(s).

7.6 ERECTION, TESTING & COMMISSIONING (Wind)

- Micro-siting of all the WEGs
- Construction of civil foundations for WEG towers.
- Transportation of all materials from the site(s) store to WEG locations.
- Erection of WEG towers on foundations.
- Installation of WEGs on erected towers.
- Installation, testing and commissioning of unit substation for WEGs and adequate internal evacuation system for 41 (+5 %) MW wind farm of Owner. The power evacuation system beyond unit substation of WEGs will be on shared basis**.**
- Testing and commissioning of WEGs.
- Installation, testing and commissioning of Grid interfacing equipment including transformers, HT lines, panels, kiosks, protection equipment, metering equipment for evacuation of power from the wind power plant to the nearest State grid sub-station
- Installation, testing and commissioning of ABT meter(s) for recording data regarding export and import of power to/from State grid and also recording KVARh & KVARh data on real time basis.
- Installation, testing and commissioning VAR drawl compensation system, if required.
- Installation, testing and commissioning of Centralized Monitoring and Control System (CMCS) for remote operation of the WEGs, receiving the data relating to WEGs, processing and getting required report on energy generation, wind speed etc. This facility for Owner wind farm shall be dedicated to OIL.

7.7 POWER EVACUATION

The bidder should have any of the following arrangements for Power evacuation.

1. Approval from GETCO / DISCOM for power evacuation facility for the wind farm in bidder's own name.

2. An Agreement with a third party, an individual or Company having approval from GETCO / DISCOM for providing power evacuation facility for the project, with no additional cost to OWNER. Bidder should clearly indicate the name of individual /company having approval of power evacuation.
3. The bidder shall furnish the Agreement along with the bid confirming reservation of adequate power evacuation capacity for the project. (BRS 19)

7.8 INFRASTRUCTURE

Suitable arrangement of water to be ensured to cater the day-to day requirement of drinking water and other needs of wind farm during entire O&M period.

Construction of approach roads and internal roads in wind farm.

7.9 EXCLUSIVE FACILITIES

The Facilities which shall be used exclusively for oil India are: (if it is in the exclusive user of the Wind Farm) or on sharing basis by investors in the Wind Farm (if OIL is not the exclusive user of the Wind Farm) including (but not limited to) the following:

- Internal evacuation system of wind farm consisting of 33 kV (or applicable voltage) lines including spur lines from individual WEG and associated equipment for transfer of wind power generated from WEGs to pooling station of wind farm.
- Pooling station consisting of EHV transformers (if required), associated equipment, control system, structures, metering system, control room building, stores etc for stepping up of voltage from internal evacuation system to appropriate State grid voltage system.
- Control room, office building, stores and any other civil structure in the wind farm.
- Central Monitoring& Control System (CMCS) including cables
- Communication network.
- Water supply arrangement.
- Firefighting device.
- Safety & security system of wind farm.
- Lighting system.
- Amenities for O&M staff and visiting officials.

7.10 COMMON FACILITIES

All internal roads including approach roads to WEGs in the wind & solar farm

7.11 MANPOWER & UTILITIES

The EPC Contractor shall give details of competent & eligible manpower to be deployed at the site(s) for store management, installation, testing & commissioning of wind energy project.

Deploy at site(s) adequate qualified manpower, cranes, special tools & tackles, required consumables, measuring & testing equipment. Arranging construction power & water as required for installation and commissioning of the project.

7.12 RECORDS

During construction, the Contractor shall keep the measured daily data at regular interval and provide the same to Oil India Ltd in electronic form. The right use of the data shall remain with Oil India Ltd. Records of foundation casting, erection and testing of major electrical items including checklists are to be maintained by the contractor.

7.13 GENERAL

To discharge obligations relating to retirement / Superannuating benefits to employees or any other benefit accruing to them in the nature of compensation, profit in lieu / in addition to salary, etc. for the period of service with the Contractor.

SECTION–VIIB
SCOPE OF WORK

(OPERATION & MAINTENANCE)

7.14 OPERATION AND MAINTENANCE

SCOPE

Owner intends to entrust the operation and maintenance (O&M) of the 41 (± 5%) MW wind farm on comprehensive basis to the Contractor on turnkey for 25 (twenty) years

The Contractor shall be responsible for all the required activities for maintenance and successful running of the WEGs for optimum energy generation as well as maintenance of associated facilities of the wind farm.

Deputation of Engineering and other supporting personnel.

Deputation of security personnel.

Keeping the WEGs in operational mode so as to get optimum energy generation from the wind energy project.

Monitoring controlling, troubleshooting maintaining of records, registers.

To maintain proper and adequate inventory of all applicable spares, consumables and fixing / application of the same as per WEGs

Conducting periodical maintenance check, testing over hauling and taking preventive action for smooth running of wind farm as required.

General up keep of all equipment, building, roads etc.

Submission of daily/periodical reports to Owner for energy generation & operating conditions of the wind farm.

Taking care of all the security aspects of the wind farm.

Continuous monitoring of performance of the Wind Electric Generators and regular maintenance of the whole system including WEGs, transformers, overhead lines, outdoor kiosks, switchgear, equipment etc. for extracting and maintaining the maximum energy output from the wind farm.

7.15 GENERAL

To maintain at the facility accurate and up-to-date operating logs, records and monthly reports regarding Operation & Maintenance of the facility.

To perform or contract for and oversee the Performance of periodic overhauls or maintenance required for the facility in accordance with the recommendations of the original equipment manufacturer.

To maintain and up-keep control room, all internal roads, tool room, stores, equipment, etc. in workable conditions.

To discharge obligations relating to retirement/ Superannuating benefits to employees (of the contractor) or any other benefit accruing to them in the nature of compensation, bonus / in addition to salary, etc. for the period of service with the Contractor.

7.16 OPERATION AND PERFORMANCE MONITORING

Operation part consists of deputing necessary manpower required to operate the wind farm at the optimum capacity.

Daily work of the operator in the wind farm shall include logging the voltage, current, power factor, Active and Reactive Power output of the 41 (± 5%) MW wind farm, keeping batteries in healthy state, individual WEG's output data once a day. The operator shall also record failures, interruption in supply and tripping of different relays, reason for such tripping, duration of interruption etc. and inform Owner of such interruptions with details very next day of occurrence. Necessary auto data recording instruments will be provided by contractor.

The operator shall record daily and monthly energy output of each WEG. Monthly Performance reports indicating turbine wise energy production, down time, capacity utilization factor, machine availability etc. shall be prepared for each WEG as well as for the wind farm and furnished in soft mode to Owner in the first week of the following month.

Wind mast as defined at clause 7.2 will be available for two years. Contractor will provide monthly wind DATA to Owner/Consultant for Energy assessment. Actual Energy output will be compared with Energy assessment.

A daily report comprising energy generation, grid availability, breakdowns, generation hours, low wind hours, machine availability etc shall be sent through e-mail and /or made available through CRM to Owner.

Monthly performance of each WEG based on the following parameters shall be prepared and submitted to Owner on 10th of succeeding month

a. Daily generation data

b. Details of preventive maintenance activities carried out during the month

c. Breakdown details along with remedial actions taken

d. Break up of down times – Technical & Non-Technical

e. Error trend

f. Component failure details

g. ROW – Reasons & remedial actions taken

Annual report of wind farm will also be prepared on above points shall be submitted in the month of April every year.

OWNER at its discretion may get the performance checked from an independent technical consultant.

7.17 PREVENTIVE MAINTENANCE

The Contractor shall draw the preventive maintenance schedules for daily, monthly and yearly and attend to the breakdowns keeping in view that the machine availability is always as per clause 6.6. A copy of such Preventive Maintenance Schedule shall be submitted to the Owner.

The Contractor shall carry out the periodical/plant maintenance as given in the manufacturer's service manual and perform minimum two certified services per annum. Such program for all the equipment shall be prepared as per operating manuals of manufacturer's and shall be implemented in letter and spirits.

Regular periodic checks of the WEGs shall be carried out as a part of routine preventive maintenance during low wind period. In order to meet the maintenance requirements stock of consumables is to be maintained as well as various spares as recommended by the manufacturer at least for 2 years are to be kept for usage.

Maintenance of other major equipment involved in wind energy farm are step up transformers, overhead line equipment, switchgear outdoor 33 kV/22 kV/11 kV VCB kiosk and metering panel. Particular care shall be taken for outdoor equipment to prevent corrosion. Cleaning of the insulators and applying Vaseline on insulators if required, shall also be carried out at every 3 to 4 months interval. Resistance of the earthing system as well as individual earth resistance is to be measured and recorded every month. If the earth resistance is high suitable action shall to be taken to bring down the same within the limits. The frequency of schedule maintenance shall be as per OEM schedule/instructions.

Maintenance record is to be maintained by the operator to record regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance, reasons for the breakdowns, steps taken for attending to the breakdown, duration of the breakdown etc.

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.

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

The Contractor will attend to breakdown jobs immediately for repair / replacement / adjustments and restore operations at the earliest during the currency of O&M Contract.

The Contractor shall immediately report the accidents, if any, to the Engineer In charge & to all the concerned authorities as per prevailing law of the State showing the circumstances under which it happened and the extent of damage and / or injury caused. O&M Contractor would be solely & fully responsible / liable to pay for any losses/damages/claims, etc. and Owner will be fully indemnified for such losses / claims.

The Contractor shall comply with the provision of all relevant Acts of Central or State Governments including payment of Wages Act, 1936; Minimum Wages Act, 1948;

Employer's Liability Act, 1938; Workmen's Compensation Act, 1923; Industrial Disputes Act, 1947; Employees State Insurance Act, 1948; Contract Labour (Regulations &

Abolishment), Act 1970 or any other law relating whereto and rules made there under from time to time.

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(s) to avoid accidents to his or his Co-Contractor or Owner's Workmen.

If in the event of negligence or mal-operation by the Contractor's operator any failure of equipment takes place such equipment should be repaired / replaced by Contractor free of cost within a reasonable period of time.

7.18 STATUTORY CHARGES & LEASE RENTAL CHARGES

Statutory charges like CEIG annual charges, annual meter testing charges, joint certification charges, O & M charges for dedicated transmission line, lease rental charges etc. or any other charges as may be required to be paid to such statutory agencies shall be quoted in the bid as applicable 7 days prior to bid closing date. These charges will be paid by the OIL from time to time post commissioning of project limited to the amount quoted. For such payment's contractor has to inform one month in advance to the Owner.

However, in case any of these charges notified 7 days prior to bid closing date is either not shown /quoted or wrongly quoted in the bid, the same will be deemed to have been included in annual O & M charges and differential amount paid by OIL on this account shall be recovered from O & M bills. Any changes in these charges after the bid closing date during the period of O & M will be to the account of OIL.

7.19 QUALITY SPARES & CONSUMABLES

In order to ensure longevity safety of the core equipment and optimum Performance of the system the Contractor should use only genuine spares of high-quality standards as recommended by manufacturers (OEM). The Contractor should keep adequate stock of spares & consumables so as to reduce the turnaround time and timely preventive maintenance. Contractor shall construct a dedicated store room to maintain minimum spares required for 2 years. List of mandatory spares is enclosed as BRS 28/29 the same is to be shared with OIL on monthly basis.

7.20 TOOLS AND TACKLES

The Contractor shall arrange for all the necessary tools and tackles including crane for carrying out all the maintenance work covered under this contract. List of tool tackles available in the stores/ site is to be shared with OIL on monthly basis.

7.21 SECURITY SERVICES

The Contractor shall arrange proper security system including deputation of security personnel at his own cost for the check/ vigil of the wind farm.

7.22 TRAINING

Providing a detailed training plan for all operation, maintenance procedures, which shall after approval by Owner, form the basis of the training program. Contractor shall impart training on site to 6 Owner engineers in O&M of Wind Energy Generators and associated equipment for two weeks. Boarding and lodging expenses of the trainees

shall be borne by Owner.

7.23 RECORD

During the O&M period, the Contractor shall keep the measured daily data at regular interval and provide the same to Oil India Ltd in electronic form. The right use of the data shall remain with Oil India Ltd. Records of WEG and associated equipment maintenance are to be maintained at site to vigil by OIL and consultant. All related stand operating procedure shall be available at site.

7.24 SCHEDULING AND FORECASTING

Scheduling and forecasting process is now required to be implemented in the Wind Sector as the Central Electricity Regulatory Commission (CERC) have notified a Regulation named Indian Electricity Grid Code Regulations (IEGC), 2010 on April 28, 2010 for helping and maintaining the Grid discipline and also formulate rules related to the operating parameters of the Indian Grid across the country. CERC has also issued IEGC Regulations, 2010 under clause (h) of subsection (1) of Section 79 read with clause (g) of sub-section (2) of Section 178 of the Electricity Act, 2003. As per CERC Order dated 16th January, 2013 the implementation date has been fixed as 1st July, 2013.

GERC vide their order dated 19.01.2019 has notified that Deviation Charges specified in the Regulations shall be effective from 1st August, 2019. As specified elsewhere in the Contract documents, to comply with statutory requirements, Regulations, Orders, Bidder would be responsible for scheduling and forecasting for the ordered capacity on behalf of the Owner.

The Operator shall appoint a QCA for the same. However, if OIL so desire, they can also appoint QCA directly and in that case all the required data, information should be timely provided to them to provide scheduling & forecasting correctly & efficiently and bidder shall not claimed any charge on account of providing data and connectivity. The Operator shall not be responsible for any financial implication arising out of RRF mechanism. Operator shall provide Communication Connectivity of pooling station to GETCO/SLDC, QCA for the purpose of scheduling & forecasting.

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SECTION– VIII

SCOPE OF WORK (SOLAR)

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SECTION– VIIIA

SCOPE OF WORK

(SUPPLY, ERECTION & COMMISSIONING)

The Scope of Supply covered under this specification shall be but not limited to the following:

8.1 DESIGN, MANUFACTURING & SUPPLY

Design, engineering, manufacture, procurement & supply of equipment, and materials, testing at manufacturers works, inspection, packing and forwarding, supply, unloading at site, associated civil works, services, permits, installation and incidentals, insurance at all stages, erection, testing and commissioning of 14 MW Solar PV Power Plant with associated equipment and materials on turnkey basis in with its Comprehensive Operation & Maintenance for 25 years thereafter

The equipment and materials for 14 MW Solar PV Power Plant with associated system (Typical) shall include but not be limited to the Supply, Erection, and Testing & Commissioning of the following:

(i) Solar PV modules including mounting frames, mounting structures, foundation bolts and nuts for holding structures and module inter connection.

(ii) Array Junction boxes /String combiner Box with surge protection and monitoring system, D C Power Interfacing Panel

(iii) Distribution boxes and fuse boxes. MCCBs, Surge Arrestors

(iv) Inverters with SCADA and monitoring system.

(v) Weather Monitoring system to check Solar Irradiation, Wind Speed & Ambient Temperature.

(vi) LT (AC) distribution Board, Plant Monitoring Desk, D C Distribution board for DC supply for plant.

(vii) Digital Voltage and Ammeter, kWh meters. Metering instrument and protection relays along with battery system.

(viii) DC cable (Copper) for interconnection between equipment including end terminations and other required accessories for DC portion of plant

(ix) Control Cables (copper) including end terminations and other required accessories.

(x) AC Power Cables (Aluminum) including end terminations and other required accessories for AC side of plant.

(xi) Battery and Battery charger.

(xii) Data acquisition system with remote monitoring facilities.

(xiii) Lightening arrestors.

(xiv) PVC pipes and accessories/trenches.

(xv) Tool kit and earthing kit.

(xvi) Metering set and protection /Isolation systems at both ends of line,

(xvii) Earthing system for PV Array, DC power system, Lightning protection system

(xviii) Adequate number of security equipment such as IP night vision, CCTV cameras, IR motion sensors etc.

(xix) Fire protection & monitoring system and firefighting equipment, Fire extinguishers, Danger Plates, Name Plate etc.

(xx) ABT Metering Set with CT- PT Set having accuracy of 0.2s class (Metering Cubicle) with Main & Check Meter at solar plant and at GETCO substation in line with Grid code.

(xxi) Suitable number of 8000 lumens, LED Bay (Flood) Light with Aluminium fixture and PC glass fixed mounted on at least 15-Meter-high Mast (Max 2nos fixers on one Mast) and to be fixed on all around Boundary.

(xxii) Transportation of equipment from Works to Site.

(xxiii) Unloading, loading of all supplied Equipment

(xxiv) Control room equipment related to solar system etc.

(xxv) Testing, maintenance and condition monitoring equipment.

(xxvi) Mandatory spares & spares for 25 years.

(xxvii) Suitable water piping lines to make permanent arrangement for module washing and their drainage,

(xxviii) Approved Size Name Board to be fixed at Entry point of Solar Plant of approved design.

(xxix) Supply and providing of suitable illumination system having LED fixtures for control room, inverters Room, outside to these buildings etc.

(xxx) Any other equipment / material required to complete the 14 MW Solar Power Plant on turnkey Basis.

(xxxi) Design of 14 MW Grid Interactive Solar Power Plant and its associated electrical & mechanical auxiliary systems includes preparation of single line diagrams and installation drawings electrical lay outs, erection key diagrams, electrical and physical clearance diagrams, design calculations for Earth- mat, Bus Bars & Spacers indoor and outdoor lighting / illumination etc. design memorandum and other relevant drawings and documents required for engineering of all facilities within the fencing to be provided under this contract, are covered under Bidders scope of work

8.2 WEATHER MONITORING STATION

One Solar Observatory including testing facilities. The Solar Observatory with associate system shall include but not be limited to the following:

- ❖ Pyranometer (1 Set) – Horizontal and Tilted.
- ❖ Modified Shade Disk Kit.
- ❖ Sunshine Duration Recorder.
- ❖ Anemometer.
- ❖ Temperature & Relative Humidity Meter.
- ❖ Particulate Meter.
- ❖ Solar Panel (35W) + Battery Bank.
- ❖ Adam Module and data logging System (8 Ch) and
- ❖ Desktop computer

The pyranometer shall be installed at the top of the control room or any other suitable location to avoid discrepancy in data recording. The recording/reading of this pyrometer shall be considered for PR and its compensation calculations.

In addition to above, the contractor is required to measure the Solar Radiation and other climatic conditions. The major categories of site-specific assessment required are:

- Annual Cumulative Solar Irradiation
- Global Solar Radiation (“GSR”)
- Diffuse Solar Radiation (“DSR”)
- Sunshine Duration
- Atmospheric Turbidity
- Temperature & Humidity
- Wind Speed

8.3 CIVIL WORKS

Civil Works of shall be performed with respect to the following but not limited to:

- Site grading, levelling, clearing of vegetation
- Design and construction of foundation for module mounting Structures.
- Modules, all electrical equipment, Transformer platform and allied equipment
- Internal road and pathways, drains and cable trenches.
- Equipment foundations
- Water treatment plant including tube well for cleaning of Modules Water Storage Tank, Water Harvesting, Sewage & Drainage System. Treated water quality shall match the potable water quality (IS 10500).
- Provision of drainage system to prevent water logging in the plant premises.

- Civil foundation work of for AC Distribution Board, DC distribution Board including applicable trenches for all UG cables
- Switchgears, Solar Road lights
- Barbed wire Fencing of transformer yard
- All foundation should be designed as per seismic Zone and other parameters of the location offered

8.4 ERECTION WORK

Erection Work shall be performed with respect to the following but not limited to:

- Solar PV Array. Inverters, all associated and allied equipment of solar plant
- Power and control Cables.
- Entire GI cable tray inside control room building
- Fabrication, supply & erection of cable trays, support, brackets and accessories in case of site fabrication cable tray.
- Galvanized steel rigid/flexible conduits and accessories, Hume pipes, ferrules, lugs, glands, terminal blocks, galvanized sheet steel junction boxes, cable fixing clamps, nuts and bolts etc. as per requirement and site-specific conditions.
- Supply of necessary steel materials for field fabrication of cable trays, supports, brackets, grounding system etc.

8.5 PRE-COMMISSIONING & COMMISSIONING

Pre-commissioning & Commissioning of all supplied Equipment. Test running of Grid Connect Solar Power Plant as well as load trials at site, prior to handover and followed by implementation of O&M contract.

8.6 OTHER ASSOCIATED WORKS

Any other items not specifically mentioned in the specification but which are required for erection, testing and commissioning and satisfactory operation of the solar power plant are deemed to be included in the scope of the specification unless specifically excluded on turnkey basis

8.7 LAND DEVELOPMENT

The EPC Contractor shall be responsible for making the site ready by clearing of bushes, felling of trees (if required), levelling of ground (wherever required) etc. for commencing the project.

8.8 MAIN POWER, UTILITY AND WATER ARRANGEMENT

Construction Power & Water as required for this contract are to be arranged by the Bidder.

8.9 OPERATION AND MAINTENANCE

Total Operation & Maintenance of Solar Photovoltaic Power Plant for the 25 year's period including insurance along with deployment of Engineering Personnel, Technicians, helpers for cleaning modules and up keeping of plant and Security Personnel.

8.10 MISCELLANEOUS WORKS

This order is on turnkey Basis so all equipment & item which are not specifically mentioned but are required for completion of work including commissioning, operation & maintenance of Solar Photovoltaic Power Plant, in every respect and for safe and efficient operation and guaranteed performance are included in scope of supply without any extra cost.

8.11 DOCUMENT AND DRAWINGS

Submission of following documents drawings data design and engineering information to Oil India Ltd. or its authorized representative for review and approval in five copies.

(i) Detailed technical specification of all the equipment

(ii) Design criteria.

(iii) Design calculations.

(iv) General arrangement an assembly drawing.

(v) Contour plan for the area.

(vi) Solar Insolation Data, Solar Generator Area

(vii) Schematic diagram for entire electric system

(viii) G.A. drawings for, all types of structures.

(ix) Quality assurance plans.

(x) Test report (for type, acceptance, and routine tests).

(xi) O&M Instruction's manuals and its drawings.

All drawings shall be fully corrected to agree with the actual "as built" site conditions and submitted to Oil India Ltd after commissioning of the project for record purpose

8.12 PROJECT AND PROGRESS REPORTING

The contractor shall forward to Oil India Ltd

(i) The Schedule for various activities in the form of PERT Chart within a week from the date of detailed work order.

(ii) Fortnightly site work progress report during construction period and

(iii) Monthly O&M reports after commissioning of the project.

8.13 OPERATION & MAINTENANCE MANUAL

Preparation and supply of detailed Operation, System and Maintenance manual of Power Plant and other major equipment

8.14 QUALITY SPARES AND CONSUMABLES

Contractor should establish a system to maintain an inventory of spare parts and tools, equipment, consumables and supplies for the satisfactory operation of facility's for all time. A separate store room should be provided at site

In order to ensure longevity safety of the core equipment and optimum Performance of

the system the Contractor should use only genuine spares of high-quality standards as recommended by manufacturers (OEM).

8.15 TRAINING

Employ and coordinate the training of personnel who will be qualified and experienced to operate and monitor the facility and to coordinate operations of the facility with the grid system

8.16 RECORDS

During the construction period, the Contractor shall keep the measured daily data at regular interval and provide the same to Oil India Ltd in electronic form. The right use of the data shall remain with Oil India Ltd. Records of foundation and associated equipment installation are to be maintained at site to vigil by OIL and consultant. All related stand operating procedure shall be available at site.

8.17 SCHEDULING AND FORECASTING

Scheduling and forecasting process is now required to be implemented in the Solar Sector as the Central Electricity Regulatory Commission (CERC) have notified a Regulation named Indian Electricity Grid Code Regulations (IEGC), 2010 on April 28, 2010 for helping and maintaining the Grid discipline and also formulate rules related to the operating parameters of the Indian Grid across the country. CERC has also issued IEGC Regulations, 2010 under clause (h) of subsection (1) of Section 79 read with clause (g) of sub-section (2) of Section 178 of the Electricity Act, 2003. As per CERC Order dated 16th January, 2013 the implementation date has been fixed as 1st July, 2013.GERC vide their order dated 19.01.2019 has notified that Deviation Charges specified in the Regulations shall be effective from 1st August, 2019. As specified elsewhere in the Contract documents, to comply with statutory requirements, Regulations, Orders, Bidder would be responsible for scheduling and forecasting for the ordered capacity on behalf of the Owner.

The Operator shall appoint a QCA for the same. However, if OIL so desire, they can also appoint QCA directly and in that case all the required data, information should be timely provided to them to provide scheduling & forecasting correctly & efficiently and bidder shall not claim any charge on account of providing data and connectivity. The Operator shall not be responsible for any financial implication arising out of RRF mechanism. Operator shall provide Communication Connectivity of pooling station to GETCO/SLDC, QCA for the purpose of scheduling & forecasting.

SECTION–VIII B

SCOPE OF WORK (OPERATION & MAINTENANCE)

8.18 OPERATION AND MAINTENANCE

SCOPE

Owner intends to entrust the operation and maintenance (O&M) of the 14 MW solar farm on comprehensive basis to the Contractor on turnkey for 25 (twenty-five) years

Deployment of Engineering and supporting personnel and regulation of their Duties.

Deployment of Security personnel and regulation of their Duties.

Successful running of Solar Power Plant for optimum energy generation.

Monitoring controlling, troubleshooting maintaining of records, registers.

Supply of all spares, consumables and fixing/application, all transformer spares, inverters indoor panels, all HT/LT panel spares, MCCBs, CTs, PTs, Bus bars, cables terminals kits, Isolators with earth switch, lightening arrestors, all transmission line accessories, Flood lights, Street Lights along with battery replacement and all other associated equipment of solar plant etc., for a period of 25 (twenty-five) years. Cost of these items (including Cost of spares) shall be included in the price quoted for O&M. Please note Oil India Ltd. will pay only O&M charges.

Supply & use of consumables throughout the maintenance period as per recommendations of the equipment manufacturers.

Conducting periodical checking, testing, over hauling and preventive action.

Daily General up keeping including cleaning of all equipment, building, amenities roads, Solar Photovoltaic land area etc.

Submission of periodical reports to Oil India Ltd. on the energy generation & Operating conditions of the solar plant.

Taking care of the full security aspects of the Solar Power Plant.

Replacement of damaged modules if any, during period of 25 (twenty-five) Years.

Replacement of Inverters and all type of Battery used in solar plant time to time if required.

Insurance covering all risks (Fire & allied perils, earth quake, terrorists and Burglary.

8.19 GENERAL

To maintain at the facility accurate and up-to-date operating logs, records and monthly reports regarding Operation & Maintenance of the facility.

To perform or contract for and oversee the Performance of periodic overhauls or maintenance required for the facility in accordance with the recommendations of the original equipment manufacturer.

To maintain and up-keep control room, all internal roads, tool room, stores, equipment, etc. in workable conditions.

To discharge obligations relating to retirement/ Superannuating benefits to employees (of the contractor) or any other benefit accruing to them in the nature of compensation, bonus / in addition to salary, etc. for the period of service with the Contractor.

8.20 REPORTS OF OPERATION AND PERFORMANCE MONITORING

A daily report comprising energy generation, breakdowns, generation hours etc. shall be sent through e-mail and /or made available through CRM to Owner.

Monthly performance of plant on the following parameters shall be prepared and submitted to Owner on 10th of succeeding month

a. Daily generation data
b. Details of preventive maintenance activities carried out during the month
c. Breakdown details along with remedial actions taken
d. Break up of down times – Technical & Non-Technical
e. Error trend
f. Component failure details

Annual report of Solar plant will also be prepared on above points shall be submitted in the month of April every year.

OWNER at its discretion may get the performance checked from an independent technical consultant.

8.21 PREVENTIVE MAINTENANCE

The Contractor shall draw the preventive maintenance schedules for daily, monthly and yearly and attend to the breakdowns a copy of such Preventive Maintenance Schedule shall be submitted to the Owner.

The Contractor shall carry out the periodical/plant maintenance as given in the manufacturer's service manual and perform minimum two certified services per annum. Such program for all the equipment shall be prepared as per operating manuals of manufacturer's and shall be implemented in letter and spirits.

Regular periodic checks of the inverter & modules shall be carried out as a part of routine preventive maintenance. In order to meet the maintenance requirements stock of consumables is to be maintained as well as various spares as recommended by the manufacturer at least for 2 years are to be kept for usage.

Schedule maintenance shall be as per OEM schedule/instructions.

Maintenance record is to be maintained by the operator to record regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance, reasons for the breakdowns, steps taken for attending to the breakdown, duration of the breakdown etc.

The Contractor shall deploy enough manpower at solar project site to carryout work instructions and preventive maintenance schedules as specified. The Contractor shall keep at least one skilled and experienced supervisor at site(s) on permanent basis to

supervise the jobs that are being carried out at site(s).

The Contractor will attend to breakdown jobs immediately for repair / replacement / adjustments and restore operations at the earliest during the currency of O&M Contract.

The Contractor shall immediately report the accidents, if any, to the Engineer In charge & to all the concerned authorities as per prevailing law of the State showing the circumstances under which it happened and the extent of damage and / or injury caused. O&M Contractor would be solely & fully responsible / liable to pay for any losses/damages/claims, etc. and Owner will be fully indemnified for such losses / claims.

The Contractor shall comply with the provision of all relevant Acts of Central or State Governments including payment of Wages Act, 1936; Minimum Wages Act, 1948;

Employer's Liability Act, 1938; Workmen's Compensation Act, 1923; Industrial Disputes Act, 1947; Employees State Insurance Act, 1948; Contract Labour (Regulations & Abolishment), Act 1970 or any other law relating whereto and rules made there under from time to time.

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(s) to avoid accidents to his or his Co-Contractor or Owner's Workmen.

If in the event of negligence or mal-operation by the Contractor's operator any failure of equipment takes place such equipment should be repaired / replaced by Contractor free of cost within a reasonable period of time.

8.22 STATUTORY & OTHER CHARGES

Statutory charges like CEIG annual charges, annual meter testing charges, joint certification charges, O & M charges for dedicated transmission line, lease rental charges etc. or any other charges as may be required to be paid to such statutory agencies shall be quoted in the bid as applicable 7 days prior to bid closing date. These charges will be paid by the OIL from time to time post commissioning of project limited to the amount quoted. For such payment's contractor has to inform one month in advance to the Owner.

However, in case any of these charges notified 7 days prior to bid closing date is either not shown /quoted or wrongly quoted in the bid, the same will be deemed to have been included in annual O & M charges and f differential amount paid by OIL on this account shall be recovered from O & M bills. Any changes in these charges after the bid closing date during the period of O & M will be to the account of OIL.

8.23 QUALITY SPARES & CONSUMABLES

Contractor should establish a system to maintain an inventory of spare parts and tools, equipment, consumables and supplies for the satisfactory operation of facility's for all time. A separate store room should be provided at site

In order to ensure longevity safety of the core equipment and optimum Performance of the system the Contractor should use only genuine spares of high quality standards as recommended by manufacturers (OEM). Contractor shall construct a dedicated store room to maintain minimum spares required for 2 years. List of mandatory spares is enclosed as 29/30 the same is to be shared with OIL on monthly basis.

8.24 TOOLS AND TACKLES

The Contractor shall arrange for all the necessary tools and tackles including crane for carrying out all the maintenance work covered under this contract. List of tool tackles available in the stores /site is to be shared with OIL on monthly basis.

8.25 SECURITY SERVICES

The Contractor shall arrange proper security system including deputation of security personnel at his own cost for the check/ vigil of the solar plant.

8.26 RECORDS

During the O & M period, the Contractor shall keep the measured daily data at regular interval and provide the same to Oil India Ltd in electronic form. The right use of the data shall remain with Oil India Ltd. Records of project maintenance and associated equipment maintenance are to be maintained at site to vigil by OIL and consultant. All related stand operating procedure shall be available at site

8.27 ONSITE TRAINING

Providing a detailed training plan for all operation, maintenance procedures, which shall after approval by Owner, form the basis of the training program. Contractor shall impart training on site to 6 Owner engineers in O&M of solar plant and associated equipment for two weeks. Boarding and lodging expenses of the trainees shall be borne by Owner.

8.28 SCHEDULING AND FORECASTING

Scheduling and forecasting process is now required to be implemented in the Solar Sector as the Central Electricity Regulatory Commission (CERC) have notified a Regulation named Indian Electricity Grid Code Regulations (IEGC), 2010 on April 28, 2010 for helping and maintaining the Grid discipline and also formulate rules related to the operating parameters of the Indian Grid across the country. CERC has also issued IEGC Regulations, 2010 under clause (h) of subsection (1) of Section 79 read with clause (g) of sub-section (2) of Section 178 of the Electricity Act, 2003. As per CERC Order dated 16th January, 2013 the implementation date has been fixed as 1st July, 2013.

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the Operator shall appoint a QCA for the same. However, if OIL so desire, they can also appoint QCA directly and in that case all the required data, information should be timely provided to them to provide scheduling & forecasting correctly & efficiently and bidder shall not claim any charge on account of providing data and connectivity. The Operator shall not be responsible for any financial implication arising out of RRF mechanism. Operator shall provide Communication Connectivity of pooling station to GETCO/SLDC, QCA for the purpose of scheduling & forecasting.

SECTION–IX

TECHNICAL SPECIFICATIONS (WIND)

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SECTION–IX

TECHNICAL SPECIFICATION FOR WIND ELECTRIC GENERATORS (WEGs) AND ELECTRICAL SYSTEM FOR INTERFACING WITH GRID

Specifications mentioned under this section are general in nature, just to elaborate our requirement. However, WEGs offered must be in line with the requirement of state utilities and other statutory authorities.

9.1 TYPE AND RATING OF WEGS

The WEGs shall be:

i. Of rating in the range of 1500 kW and above
ii. Upwind type
iii. Three blade type
iv. Horizontal axis with active yawing
v. Power Regulation (Pitch/Stall)
vi. Grid compatible type
vii. Single speed, dual speed or variable speed
viii. Of having survival wind speed capable to withstand cyclonic effect in the offered area.
ix. Generator having insulation class 'F' or better.

9.2 GRID CONDITIONS

Bidder shall ensure compliance with the requirements of “Indian Electric Grid Code” 2010 notified by CERC in general & following operating grid condition in particular

Frequency	: 50 Hz, + 2 and (-) 2.5 Hz
Voltage	: ± 10%
Maximum asymmetric voltage	: 2% (Phase to ground) for 60 sec.
Maximum asymmetric current	: ± 10% of nominal current

The WEGs shall have adequate protection and control to operate in parallel and synchronized manner with State grid. The tolerance limits indicated may, however, be exceeded in actual conditions and the WEGs shall be protected from damages against such exceeding of limits. WEG should be compliant to fault ride through (FRT), Low Voltage Ride through (LVRT) requirements.

9.3 DESIGN CRITERIA

The WEGs shall be designed to have a life of not less than 20 (twenty) years for continuous operation. Bidder shall indicate the list of components whose life may be less than 20 (twenty) years, indicating approximate actual life of such items. The WEGs

should be suitably designed to perform satisfactorily at rated capacity in Indian climatic conditions with particular reference to offered site. The WEGs shall be designed to accept Indian make sub-components and consumables such as contactors, thyristors, fuses, lubricants etc. All material, components, sub-assemblies and equipment should be absolutely brand new. The blades should be designed based on standard specifications such as IEC 61400-1 which may be indicated by number, date of issue, authority of issue.

9.4 LOCAL CONTROL SYSTEM (LCS)

Each WEG shall have a Local Control System (LCS) and it shall be designed for automatic, unattended operation based on a microprocessor/PLC-controlled system with a power backup. The microprocessor and power control units shall be located properly and well ventilated. In case of tubular tower, the LCS shall be capable of operating satisfactorily at such temperature that may exist inside the tower without exceeding the permissible temperature rise**.** The LCS shall be able to display basic operating functions of the WEG and also the provision for stopping and restarting the WEG. In case offered WEG model does not have the display in the local control system laptop should be made available during the visit of owner to view the display at LCS.

The LCS shall communicate with Central Monitoring & Control System at Master Control Room for operation, monitoring & control of all the WEGs, for display & record of important parameters, for providing annunciations (or error messages) and stop, display & restarting of WEGs again on acceptable conditions.

The LCS shall have following features:

A. Display and record the following parameters:

i. Power (kW)
ii. Voltage (V), of all the three phases in RMS values.
iii. Frequency (Hz)
iv. Current (A) of all the three phases in RMS values.
v. Power factor
vi. Rotor Revolution Speed (rpm)
vii. Brake activation
viii. Maximum power generated (kW) with time of generation
ix. Cumulative energy production
x. Cumulative active energy consumption from grid
xi. Cumulative reactive energy consumption drawn from grid
xii. Energy production for the grid (kWh)
xiii. Operation time of generator
xiv. Status of wind turbine
xv. Yaw angle
xvi. Wind speed (m/s) and direction of wind flow.
xvii. Actual reactive power consumption (kVAr)

xviii. Temperature of generator, gear box, nacelle and control panels

xix. Hydraulic oil pressure

xx. WEG availability period

xxi. Lull period

B. Annunciations for the following conditions

i. Low oil level or pressure in gear box

ii. Yaw failure

iii. Cable twist

iv. Control system failure

v. Excessive vibration in nacelle

vi. Worn-out brake pads

vii. Abnormal temperature in generator, gear box, yaw motor, and control panel

viii. Grid failure i.e. frequency error, excess current asymmetry, voltage failure

ix. Over speed of rotor and generator

x. Activation of emergency stop brake

xi. Failure of capacitor units

C. Stop, display and restart again when conditions are acceptable:

i. Low wind speed

ii. Excessive wind speed

iii. Untwisting of cables

iv. Activation of stop push button (restart when start push button is activated)

D. Stopping the WEG automatically whenever the grid supply fails

E. Auto start of WEG on resumption of healthy grid supply irrespective duration of Grid failure

F. The LCS shall be connected with the Central Monitoring and Control System. (SCADA) It should be possible from central monitoring and control system at the master control room to control all the Wind Electric Generators, give commands, record their various data and take out the printed reports of energy generated from the wind power project as a whole and from each WEG, export /import of energy etc.

9.5 START-UP

The WEG must be equipped with a soft start arrangement for limiting the starting current and avoiding peak loads on the grid and excess voltage drop across the generators. The maximum inrush/starting current shall not exceed 1.5 times full load current of the generator.

9.6 GENERATOR

The generator shall be of three phase asynchronous / synchronous type and compatible

for 50 Hz grid connection. The generator shall be designed for tropical environment and in accordance with relevant international standards, which should be stated in the offer in adequate detail. The rated output and voltage shall match the varying availability of wind on the one hand and all possible grid conditions on the other. The insulation class should be F or better.

In case variable speed WEGs are offered, the power electronics shall be suitable for Indian grid conditions.

Suitable device to monitor and control the temperature for ensuring proper functioning of all the equipment shall be provided. Successful bidder shall supply a copy of type test report and routine test reports for each Generator.

Generators shall be provided with temperature sensors and installed in the stator winding being part of the generator protection system. Generator windings etc. must be special corrosion protected to cope with condensation problem caused by the high RH – temperature gradient on the site. Generator should be protected against short circuit, earth fault and overload as per relevant IS or IEC code.

9.7 CAPACITORS (if required)

The WEG shall be provided with capacitors in case of induction generators, for maintaining a minimum power factor of 0.95 at full load and as close to unity as possible during the entire range available. The capacitors shall be cut in after the start-up procedure is terminated. Self-excitation of WEG due to capacitors is to be avoided. The bidder shall furnish the rating of the capacitors. Capacitors shall be housed in a separate panel so that proper ventilation is maintained and the heat dissipated from the capacitors shall not affect components in the switchboard. Capacitors should be designed for tropical environment and in accordance with relevant International and Indian Standards which should be stated in the quotation. All penalties/charges payable to SEB due to low power factor and reactive energy consumption beyond prescribed limits shall be borne by the Bidder only. Safety equipment must be provided for switching off the device for the capacitors so as to prevent excess voltage production WEG without being connected to the grid. The rated voltage of capacitors must be equal to the turbine nominal voltage +15%. Capacitors must meet standard IS 2993-1974IEC/EN/VDE. Switching contactors should have proper rating to handle making and breaking capacitor current.

9.8 BRAKING SYSTEM

The WEG shall have the provision for soft braking to avoid excessive loading on parts and structure. Each WEG shall have two independent braking systems and out of the two brakes, one of them may be aerodynamic type and act at 10% (ten percent) over-speed of the rotor. If aerodynamic brake is not provided, the bidder should furnish full details as to how the WEG will be “failsafe”, even when grid power is not available. The bidder along with explanatory notes on their working principle shall indicate expected life of the braking system and the pads.

9.9 TOWER

Tower may be either lattice type, or tubular (steel or pre-stressed concrete) type or hybrid type or combination of lattice & tubular section. Steel structure portion of tower shall be galvanized, tubular steel /concrete tower may be painted with anti-corrosion paint as per specifications & in accordance with Indian/International standards. 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. Suitable numbers of sets of templates to fix the foundation bolts in the concrete should be supplied. The tower should have convenient climbing devices and suitable landing platforms. Safety arrangements e.g. rope, belts etc. should be provided. Necessary foundation bolts/anchor plates/stubs should also be supplied. The exposed portion of the foundation bolts should be galvanized/ painted with anti-corrosive paint as per relevant BIS/international codes.

9.10 SWITCH BOARD

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

Frequency	:	50 Hz + 2 Hz (–) 2.5 Hz
Voltage	:	±10%

Degree of protection:

1. In door air-conditioned areas	:	IP22
2. In door non air-conditioned areas		
a. Ventilated enclosure	:	IP42
b. Non-Ventilated	:	IP54
3. Outdoor	:	IP55

Switch board shall be provided with adequately rated copper bus bar, incoming control, outgoing control etc. as a separate compartment inside the panel to meet the requirements of the CEA/CEIG. All live terminals and bus bars shall be shrouded. The outgoing terminals shall be suitable to receive suitable runs and size of cables required for the WEG/Transformer rating.

Switchboard shall be designed and manufactured in accordance with the relevant Indian standards/IEC/EN/VDE. Distribution boxes, junction boxes, cold junction boxes, terminal boxes and all field mounted equipment to be furnished as per this specification shall have weather proof protection conforming to IP 55.

Separate control and power panels shall be provided with separate power circuit for isolated operation of control circuit.

9.11 EARTHING & LIGHTNING PROTECTION

Earthing (or grounding) of WEGs, transformers and all electrical installations shall be under the scope of bidder. All electrical frames shall be effectively connected to earth at least at two points. Material required for earth electrode as well as earth current conductor shall be supplied by the bidder. Combined earth resistance at each WEG shall not be more than two Ohms. Earth electrode shall be designed to withstand the maximum possible short circuit current. Lengths of electrodes shall be such that the combined earth resistance shall not be more than two Ohms.

Bidder shall provide suitable independent earthing system for protection of blades, nacelle, and tower and step up transformer against any lightning surge. Effective earth

resistance on individual electrodes shall not be more than 5 Ohm (Five Ohm) and the combined earth resistance shall not be more than two Ohms. The work shall be executed, as per is IS: 2309 / 3043. Bidder should append a drawing showing the earthing arrangement for WEG and transformer. Care shall be taken to protect electric and electronic equipment within the control panel against any lightning/switching surges which are expected in electrical network. For this purpose, the bidder shall provide suitable arrangement in the panels.

The bidder shall provide suitable lightning protection system at the highest possible point on the WEG.

9.12 WIND MONITORING MAST

Refer clause No.7.2.

9.13 ENVIRONMENTAL PROTECTION

Lattice towers shall be galvanized to relevant standards applicable to galvanization of fabricated steel structures. Minimum thickness of galvanizing shall be 120 microns, irrespective of whether it is hot dip galvanized or spray galvanized. These towers will be inspected at site and if damage to galvanization is noticed or the thickness of any section is found inadequate, such tower shall be replaced by the bidder to the satisfaction of the OWNER. Site galvanization or site repairs will not be permitted.

Tubular tower should be painted with anti-corrosion paint in accordance with EN-ISO 12944 (Part-4).

All materials, components and equipment shall function and work properly during the lifetime against deterioration that may be caused due to hostile climate conditions. The bidder shall submit descriptions of protection methods to be used for all components. All exposed iron components such as tower, nacelle and hub should be galvanized. Only hot dipped galvanized bolts and nuts should be used. Switchboards shall have two coats of epoxy painting of 120 microns thickness over two coats of primer. Alternatively, these can have powder coating having thickness more than 60 microns.

9.14 MICRO SITING

The bidder shall carry out Micrositing, erection, start-up and commissioning work. The bidder shall be responsible for bringing to site(s) and deployment of all the required tools, cranes and other equipment/instruments required for this purpose. Bidder shall furnish Micrositing data to Owner/Consultant for review.

9.15 MNRE APPROVAL

The model of WEG offered should be of type tested design and should have been included in the “List of Models and Manufacturers of Wind Electric Generators / Wind Turbine Equipment” published by MNRE as on the date of opening of the bids. Bidder shall submit a copy of such updated list published by MNRE with the bid.

9.16 TECHNICAL DATA

The bidder shall furnish technical data and documents complete in all respect as per the requirement of bidding document.

9.17 OPERATION & MAINTENANCE CHECKS

The successful bidder shall carry out O&M checks at regular intervals viz. daily, weekly, monthly, quarterly, half yearly and yearly basis during warrantee period and O&M period for which details of such checks shall be furnished along with the bid.

9.18 ELECTRICAL SYSTEM FOR INTERFACING WITH THE GRID

Each WEG will be connected to grid through unit transformer of suitable capacity and voltage ratio, internal overhead line, common control & metering station(s),if required / common EHV sub-station(s) at wind farm up to grid interconnection point., external overhead line up to the grid sub-station of SEB/ DISCOM's complete with all associated switch gears and materials including the requirement of reactive power management and data communication equipment so as to meet the requirements of State Load Dispatch Centre (SLDC) and State/applicable Grid Code including Connectivity requirements System needs to be designed looking to the requirement for scheduling & forecasting.

Bidder shall design electrical system in accordance with the Indian Electricity (IE) Rules, Chief Electrical Inspector General (CEIG) requirements, Standard Practices of SEBs DISCOM's Code of Practices issued by Bureau of Indian Standards (BIS).

Bidder shall submit complete scheme for grid interfacing & interconnection for wind farm at each site including schematic diagrams and the basis of design & brief specifications of equipment, materials and installations along with the offer.

All equipment / materials shall be suitable for the site conditions and shall be manufactured strictly in accordance with latest relevant Indian Standards published by BIS and all similar materials and removable parts shall be uniform and interchangeable with one and another. Adequate preventive measures shall be taken against hostile climatic conditions like temperature, corrosion, salinity, humidity, sand storms, wind pressure etc.

Electrical installations shall be constructed strictly according to the following:

I. Relevant Code of Practices issued by Bureau of Indian Standards (BIS).

II. Electricity Act, 2003.

III. Statutory requirements by Chief Electrical Inspector (CEI) of the State.

IV. IEGC notified by CERC

V. Standard Practices followed by SEBs / DISCOMs

VI. Central Electricity Authority (CEA) Guidelines.

VII. Central Board of Irrigation and Power (CBIP) Manuals.

VIII. Rural Electrification Corporation (REC) Manuals.

Any item not specifically mentioned but found essential for successful operation of electrical system with full safety according to statutory requirements shall be included in scope of work of the bidder.

Unit substation area of each WEG shall be provided with fencing of 1800 mm height.

9.19 MCCB/ACB

MCCB/ACB at the power panel of each WEG provided should take care during full load current exceeding the specified limit.

Each WEG shall have recording facility of generation and consumption of active and reactive energy, instantaneous power and power factor besides other operational data in the local control system.

9.20 **CABLES**

Power cables for interconnection from generator terminals to power panel; power panel to step up transformer and all other cables used in the wind farm shall fulfill requirement of IEC/BIS codes with a minimum rated voltage of 1100/600 V. Core insulation shall be colour-coded or identified by wrapping colour tapes. The bidder shall furnish size, number of cores and rating of the cables in the bid.

9.21 **SOURCES OF COMPONENTS**

The bidder shall furnish the make and source of various components of the WEG as per format given in the bidding document. List of preferred suppliers of bought out items are given at Annexure –VI.

9.22 **DESIGN IMPROVEMENT**

The bidder may suggest for improvement in specifications, if any, of equipment which could yield in better performance of machines. Such suggestions could be discussed based on merits and modifications in the specifications could be considered, if found appropriate.

If any of the agreed change is such that it affects completion schedule, the parties may agree for revised completion schedule before the bidder proceeds with the change.

9.23 **TEST / INSPECTION**

Refer Clause No. 5.28 of Section-V (Special Conditions of Contract for Supply, Erection & Commissioning) of the Tender document.

9.24 **STANDARDS & STATUTORY REQUIREMENTS**

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

9.25 **TECHNICAL INFORMATION TO BE PROVIDED BY THE BIDDER**

The successful bidder shall be required to provide three copies of the following information, drawings and documents, within two weeks of the placement of order:

i) Technical particulars and general data of WEGs, Generator, Rotor, Tower, Yawing system, Brake system, Gear system (in case of geared machines), Hub, Nacelle, Main shaft, Main bearing, Coupling, Power panel, Control system, Power factor compensation (if required), AC-DC-AC convertor (if required).

ii) Technical particulars of transformers indicating losses, circuit breakers, current transformers, potential transformers and cables.

iii) Specification of anti-corrosion treatment.

iv) PERT/GANTT diagram showing broad time schedule of supply, erection and

commissioning.

v) Protection scheme of unit substation and WEG.

vi) Micrositing plan of WEGs

vii) Wind farm layout drawings indicating WEGs, roads, overhead lines, sub-stations, buildings etc.

viii) G A drawing of entire electrical system for grid interfacing & Interconnection.

ix) Foundation drawings for towers.

x) SLD of the evacuation system with conductor size etc like unit substation, 33kV internal overhead line, common group control and metering station, if required, common EHV substation, external overhead line up to the grid substation of the sub-station

9.26 TECHNICAL INFORMATION TO BE FURNISHED AFTER AWARD OF CONTRACT

i) Description of erection procedure.

ii) Operation & maintenance and troubleshooting manual including drawing for local control system.

iii) Equipment drawings and instruction manuals of original equipment manufacturer for major/critical equipment.

iv) Copies of type test certificates, routine tests and acceptance tests of major items of WEG, transformers and CBs.

v) Soil test report indicating safe bearing capacity.

vi) Concrete design mix report.

vii) Batch test certificate of reinforcement steel and steel used for towers.

9.27 STATUTORY AND OTHER REGULATIONS

All works shall be done as per statutory Acts, Rules and Regulations of the State Govt. and our own Authorities or as applicable.

9.28 PROTECTION AGAINST HIGH TEMPERATURE, CORROSION, DUST STORMS ETC.

WEGs need to be suitably protected against high temperature and dust storms. All equipment shall be designed to withstand high temperature and dust storms of the area where the WEGs will be installed.

All materials, components and equipment shall function and work properly during the lifetime without deterioration due to the aggressive soil, climatic conditions, cyclones and dust loading. Bidder shall submit protection methods / precautions to be adopted for the satisfactory Performance of WEGs for such conditions, without fail.

9.29 CENTRAL MONITORING AND CONTROL SYSTEM (CMCS)/SCADA

At the project site CMCS on sharing basis with proper software such as SCADA shall be provided. This should be complete with all hardware and software for displaying, recording; monitoring and control of operational parameters of all WEGs. Necessary interface facilities shall be provided. "Supply of Central Monitoring & Control System (CMCS) complete in all respect with necessary software, hardware, cables etc"—The system is to be designed in the manner that the generations, the relevant details&

operational parameters sourced from CMCS would be made available to owner on real time basis at its OIL/Consultant designated office through in house customer portal via internet for required analysis and report preparation/forecasting and onward transmission to meet the requirements of State Load Dispatch Centre (SLDC).

Electrical supply from the grid for CMCS room shall be arranged by the contractor which shall meet all electrical load requirements such as lighting, air conditioning, SCADA system, battery charging etc. There shall be an un-interrupted power supply (UPS) system of appropriate capacity for CMCS

SCADA connectivity as above shall be completed on or before completion of stabilization period

Communication Connectivity of pooling station to TRASCO/DISCOM Grid for the purpose of scheduling & forecasting

9.30 WEG FOUNDATION AND OTHER CIVIL WORKS

A) Scope of Work

The scope of work under civil work shall include:

a. Land development for the wind farm.

b. Conducting contour survey and soil testing.

c. Foundations of WEGs.

d. Switchyard civil works including foundations of step-up transformers & HT switchgear kiosk and structural steel.

e. Room for housing WEG local control panels (applicable for WEGs with lattice type tower).

f. Construction of suitable control room for housing the CMCS equipped with air conditioner on shared basis.

g. Office cum stores building on sharing basis.

h. Wind farm approach road and internal roads on sharing basis

i. Basic amenities for staff on sharing basis.

B) Design Criteria

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

The Bidder shall conduct geo-technical investigation and decide on various design parameters he proposes to adopt for foundation design. No commercial implications for any variations in this regard during execution shall be entertained.

All structures and portions thereof shall be analyzed and designed to sustain various loads and combinations thereof, conforming to the latest revision of applicable Indian Standards, specifications, engineering practice and other technical requirements. All

structures shall be designed to sustain worst combination of dead loads plus assigned live loads, equipment, wind, seismic, temperature or other loads it is being subjected to.

Minimum factors of safety against overturning, sliding and hydrostatic uplift adopted for design shall be mentioned by the bidder in the bid.

Stability of structures shall be investigated for loading conditions during construction. However, factors of safety given in relevant Standards and codes shall also be taken care of.

C) Materials & Job Specifications

All materials which may be used in the work shall be of standard quality manufactured by renowned concerns conforming to Indian Standards or equivalent, shall have IS mark as far as possible, unless otherwise approved by Engineer In-charge. The Contractor shall get all the materials approved from Engineer In-charge prior to use. The Engineer In-charge shall have right to determine whether all or any of the materials are suitable. Any materials procured or brought to site and not conforming to specifications and satisfaction of the Engineer-in-charge shall be rejected and the Contractor shall have to remove the same immediately from site at his own expense and without any claim for compensation due to such rejection.

Providing & operating necessary measuring and testing devices and materials including all consumables are included in the scope of work. No separate measurement or payment for testing the work shall be made. The rates quoted for various items shall be deemed to include the cost of such tests which are required to ensure achievement of specified qualities.

D) Detailed Contour Survey & Soil Investigation of the Site(s)

A detailed contour survey with 2 m contour interval in case of uneven land and at 5 m interval in case of even land shall be carried out and drawings prepared by the EPC Contractor. Boundary stones shall be fixed for identification of land along the border of the area. The EPC Contractor shall also be responsible for detailed soil investigation at all WEG locations for the purpose of foundation design.

E) Land Development for site(s) activities

The EPC Contractor shall be responsible for making the site ready by clearing of bushes, felling of trees (if required), leveling of ground (wherever required) etc. for commencing the project.

F) WEG Tower Foundation

i) General

The work shall comprise of design and construction of wind turbine foundations as per locations indicated on the final layout drawings prepared after Micrositing.

The successful bidder shall furnish sources of steel (Reinforcement and structural), cement and concrete ingredients i.e. coarse aggregate, fine aggregate, water and admixture. The foundation design shall suit the local soil conditions and the materials used viz. cement, reinforcement steel etc. shall conform to relevant standards. Bidder shall furnish the safe bearing capacity of soil, concrete mix design calculations, and detailed construction drawing for the

foundation for the WEGs to OWNER before proceeding with the work. The Contractor shall mention the survival wind speed considered for design of WEG Tower Foundations.

ii) Excavation, back filling and stone pitching

The Contractor shall carry out all excavation works in accordance with the dimensions and levels indicated on the drawings.

The excavated material under above categories shall be kept separately, so that good quality material can be used, as required.

Excavation shall be carried out in accordance with the guidelines given in IS: 3764-1992 "Safety code for excavation work".

Blasting, if required, shall be carried out strictly in accordance with IS: 4081-1986 "Safety code for blasting and related drilling operations" and the latest State laws, regulations and rules. Blasting, if done, shall at all times be carried out under the supervision of fully qualified, experienced and licensed supervisors.

If any damage of any kind occurs, the Contractor shall be solely responsible for such damages or any claims that may arise there from, and shall, at his own expense, carry out repairs or restoration as the Site Engineer may direct.

The Contractor shall obtain written permission of the Site Engineer for each location where the Contractor wants to use explosives.

Back filling of foundation shall be carried out as shown on the drawings or directed by the Site Engineer with suitable materials. Filling materials shall be spread, leveled and thoroughly compacted in layers not more than 20 cm thick or as directed by Site Engineer. Each layer shall be separately compacted to achieve the required state of compaction to be confirmed by FDD test.

Wherever shown on the drawings / directed by Site Engineer, dry stone pitching shall be placed at suitable locations to protect the slopes. The area to be pitched shall be trimmed and any loose material re-compacted. Pitching shall be laid on a bed of approved granular material.

iii) Reinforced Concrete & Plain Cement Concrete Works

The works shall consist of making and placing concrete for reinforced concrete works in conformity with the drawings or in accordance with the written instructions of the Site Engineer.

All materials, workmanship and testing shall comply with the latest revisions of the relevant Indian Standards Codes of Practices referred to in these specifications and notes given on the drawings.

Unless otherwise stated in these specifications, the IS: 456-2000 “Code of practice for Plain and Reinforced Concrete", and the standards referred to in this code of practice are applicable to reinforced concrete work.

Water used for all purposes throughout the works shall be according to IS: 456-2000.

Potable water is generally satisfactory but it shall be tested prior to use in works

and confirm to the permissible limits outlined as per IS: 456-2000, when tested in accordance with IS: 3024-1964. The pH value of water shall not be less than 6.

Coarse aggregate shall be sampled and tested according to IS: 456-2000 and IS: 2386 (part 1 to 8)-1963 (reaffirmed 1990). To be acceptable, the results shall fall within the grading indicated in IS: 383-1990. Coarse aggregates shall be obtained from natural sources crushed or uncrushed or combination thereof from approved quarries. It shall be hard, strong, dense, durable, clean and free from foreign matters. It shall be roughly cubical in shape and shall comply with IS: 383-1999. Maximum quantities of deleterious materials in the coarse aggregate shall not exceed the limits laid down in IS: 383-1999.

Single sized coarse aggregates shall be graded as specified in IS: 383-1990. Maximum size of coarse aggregate shall be 40 mm for Plain Cement Concrete and 20 mm for Reinforced Cement Concrete.

Fine aggregates shall be sampled and tested according to IS: 456-2000 and IS: 2386 (part 1 to 8) -1963 (reaffirmed 1990). To be acceptable the results shall fall within the grading zones I-III laid down in IS: 383-1990.

Fine aggregates shall be hard, durable, clean and free from adherent coating and organic matter and shall not contain clay. Sand shall not contain harmful impurities such as iron, pyrites, coal particles, lignite, mica shell or similar laminated and other impurities which might affect the durability of concrete or attack the reinforcement.

When tested as per IS: 2386 (part 1 to 8) 1963 (reaffirmed 1990) fine aggregate shall not exceed the permissible quantities of deleterious materials outlined in IS: 383-1990. It shall be obtained from natural sources such as Natural River or pit sand, crushed stone sand or mixture of these alternatives.

The Contractor shall perform trial mixes and preliminary tests of each class of concrete. The selection criteria will be compressive strength, workability and surface finish and shall follow the procedures outlined in IS: 456-2000.

Concrete tests shall be carried out before undertaking the works according to the composition selected for the purpose of the concrete works.

The concrete shall be mixed in a mechanical mixer. The mixing shall be according to IS: 4926-1976 (reaffirmed 1990).

Concreting in unfavorable weather will not be permitted. Precautions outlined in IS: 7861 (part 1)-1974 (reaffirmed 1990) and IS:7861 (Part-2) 1981(reaffirmed 1987) shall be followed.

All concrete surfaces shall be maintained in moist condition and protected against harmful effects of weather, for at least for two weeks of placing.

iv) Shuttering

The works shall consist of supply, fabricating, placing and removing all temporary forms for shaping of concrete, together with all temporary construction required to support such forms. The Contractor shall be responsible for the correct dimensions, alignment, leveling, cleaning and oiling. All shuttering shall be approved by Engineer-in- charge but it will not dilute in any way Contractor's

responsibility.

Shuttering shall not be removed before the concrete is sufficiently set and hardened.

v) Steel Reinforcement

The work shall consist of supplying, cutting, bending, placing and fixation of reinforcement bars of the grade, type and size specified on the drawings. Unless otherwise stated in this specification the IS: 2402-1963 (reaffirmed 1990) shall be applied to this work.

Reinforcement shall be high strength deformed bars grade Fe-415, Fe-500 as mentioned in the drawing, confirming to IS: 1786-1985 (reaffirmed 1990). The Contractor shall furnish test documents of steel reinforcements to be used in the works or get required tests done at an approved laboratory.

vi) Anchor Plates/Anchor Bolts/Stubs/Circular Embedment

Anchor plates/Anchor Bolts/Stubs/Circular Embedment along with necessary templates will be provided by the wind electric generator supplier. The Contractor shall be responsible for correct placing and fixation in accordance with dimensions, levels and specifications within the tolerances given on the drawings.

vii) P.V.C Tubing

P.V.C tubing for laying of cables shall be provided as per diameters shown on the drawings. P.V.C tubing shall be of Class-3 and suitable for a working pressure of 6 kg/cm². The P.V.C tubing shall comply IS: 4984-2000 and IS: 7834 -1987. Solvent cement shall be used for jointing of P.V.C. tubing.

viii) Soil Investigation

Records of all soil investigations shall be kept as a part of final project data. Soil investigations shall be carried out in compliance with IS: 1892-1979 (reaffirmed 1987), IS: 1498-1970 (reaffirmed 1987), IS:2720 (part 28)-1974 (reaffirmed 1988), IS:2131-1981 (reaffirmed 1987) or any other pertinent Indian Standard or recognized specification to the approval of the Site(s) Engineer.

G) Control Cabin

In case of lattice type towers for the WEGs, it is essential to provide control cabin for housing the switchboard and local control panels. The control cabin shall be designed to suit the soil conditions. The size of the cabin shall be adequate to house the equipment with required clearances and operating space as required by CEA/CEIG. Cabin shall be constructed by using good quality stones/bricks. The wall thickness shall be minimum 200 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 cabin, in the bid, in case the bid is for WEGs with Lattice Towers.

H) Switch yard 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 concrete or dressed stones masonry conforming to relevant standards. The height of transformer/HT Switchgear kiosk plinth shall be decided based on the requirement of ground clearance as per voltage of unit substation.

Earth pit construction shall be of brick masonry with precast RCC (1:2:4) cover. The fencing of the switchyard shall be with GI chain link of 1800 mm height with MS Angle posts. The gate shall be made of steel of the same height as that of the fencing.

I) Building

For the operation & maintenance of wind farm the Office cum control room building of suitable size should be constructed as per relevant Indian Building Standards for common use.

Control room building shall comprise of the following:

- CMCS Room: This room shall house the CMCS and shall be sized suitably as per the requirements of the offered equipment. There should be adequate facilities for officers visiting on behalf of the Owner during their visit to the site which includes sitting arrangement, arrangement of water, electricity etc. The room shall be appropriately air- conditioned to maintain suitable temperatures for personnel & equipment in the building during all climatic conditions.
- Store room: A store room or storage space on sharing basis within the building of appropriate size for spares and consumables shall be provided in the building.

J) Approach Roads & Internal Roads

All the WEGS shall be accessible through approach roads and internal roads suitably for transporting the plant equipment, spares, cranes & other maintenance machinery. The bidder shall furnish the drawing of approach road/internal road taking into account geographical terrain of the area. Width of the carriageway shall be kept as 5.0 meters. (Minimum) Extra width shall be provided at curves and hair pin bends. For all other minor roads, carriageway shall be of 3.75 m width. Roads shall be provided with proper roadside ditches, under drains and R.C.C pipe culverts as per site requirement to carry out the natural flow of water. Where ever necessary embankment and retaining wall shall be provided of adequate strength to sustain heavy vehicular movement.

The contractor shall furnish Pathway agreement (as per attached format) against owner right to share the common facility located near wind farm /with other co-owners of wind farms.

SECTION–X

TECHNICAL SPECIFICATIONS (SOLAR)

SECTION-X

TECHNICAL SPECIFICATION (SOLAR)

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SECTION-X

TECHNICAL SPECIFICATION

10.1 SOLAR SYSTEM AND POWER EVACUATION

The main objective of the design philosophy is to construct the plant with in-built quality and appropriate redundancy to achieve high availability and reliability with minimum maintenance efforts. In order to achieve this, the following principles shall be adopted while designing the system.

10.1.1 Adequate capacity of SPV modules, PCUs, Junction boxes etc. to ensure generation of power as per design estimates. This will be done by applying liberal de-rating factors for the array and recognizing the efficiency parameters of PCUs, transformers, conductor losses, system losses, site conditions etc.

10.1.2 Use of equipment and systems with proven design and performance that have high availability track records under similar service conditions.

10.1.3 10.1.3 Selection of the equipment and adoption of a plant layout to ensure ease of maintenance.

10.1.4 Strict compliance with approved and proven quality assurance (QA) systems and procedures during different stages of the project, starting from sizing, selection of make, shipment, storage (at site), during erection, testing and commissioning.

10.1.5 Proper monitoring of synchronization and recording, to ensure availability of power to the grid.

10.1.6 The plant instrumentation and control system should be designed to ensure high availability and reliability of the plant to assist the operators in the safe and efficient operation of the plant with minimum effort.

10.1.7 It should also provide the analysis of the historical data and help in the plant maintenance people to take up the plant and equipment on predictive maintenance.

10.1.8 System design shall have intelligent protection mechanism which may include very fast responsive microprocessor-based relays etc., so that any disturbance from the grid will not cause any damage to the equipment of the Solar Power Plant.

10.1.9 The basic and detailed engineering of the plant shall aim at achieving high standards of operational performance especially considering following:

10.1.10 SPV power plant should be designed to operate satisfactorily in synchronization with the grid within permissible limits of high voltage and frequency fluctuation conditions. It is also extremely important to safeguard the system during major disturbances, internal and external surge conditions while ensuring safe operation of the plant.

10.1.11 Fixed tilt/Seasonal tilt of SPV arrays such that SPV arrays produce maximum energy.

10.1.12 Shadow free plant layout to ensure minimum losses in generation during the day time.

10.1.13 Higher system voltage and lower current options to be followed to minimize ohmic losses.

10.1.14 Selection of PCUs with proven reliability and minimum downtime. Ready availability of requisite spares

10.1.15 Careful logging of operational data / historical information from the Data Monitoring Systems, and periodical analysis of the same to identify any abnormal or slowly deteriorating conditions.

10.1.16 The designed array capacity at STC shall be suitably determined to meet the proposed guaranteed generation output at the point of interconnection by the contractor in his bid. The contractor shall take care of first year degradation also by installing additional DC capacity as the CUF calculations will not factor the first-year degradation of the modules.

10.1.17 Each component offered by the bidder shall be of established reliability. The minimum target reliability of each equipment shall be established by the bidder considering its mean time between failures and mean time to restore, such that the availability of complete system is assured. Bidder's recommendation of the spares shall be on the basis of established reliability.

10.1.18 Bidder shall design the plant and equipment in order to have sustained life of 25 years with minimum maintenance efforts.

10.1.19 The work execution planning for supply, erection, commissioning and all other allied works for SPV Power Plant shall be such that it is completed within stipulated time from the date of order/ LOI/ NTP.

10.2 The specifications provided with this bid document are functional ones; any design provided in this document is only meant as an example. The Contractor must submit a detailed design philosophy document for the project to meet the functional requirements based upon their own design in-line with the above. The bidders are advised to visit the site and satisfy themselves before bidding.

(A) ELECTRICAL EQUIPMENT AND MATERIAL

The equipment and material for 14 MW Solar Photovoltaic Power Plant with associate system (typical) shall include following but not be limited to the following: (Only the technical features of major equipment's are described here under).

10.3 **SPV CRYSTALLINE MODULES:**

10.3.1 SPV Poly / Mono crystalline silicon modules to be supplied shall be of repute make, (cells / modules may be manufactured in India or abroad) confirming to Tier -1 and in the ALMM list as per MNRE Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirements for Compulsory Registration) Order, 2019.

10.3.2 The bidder may use 340 Watt or higher capacity (in Wp) modules in appropriate numbers in order to meet the required capacity of 14 MW. Spacing between rows shall be so designed that shadow of one row to next is avoided.

10.3.3 Stabilized output of the Solar Power Plant shall not be less than 14 KW under Standard Test Condition after one year of operation from date of Commissioning of solar plant.

10.3.4 Peak power point voltage and the peak power point current of any supplied module and / or any module string (series connected module) shall not be more than 3% from the respective arithmetic means for all modules and / or for all module strings, as the case may be.

10.3.5 The solar cell shall have surface anti-reflective coating to help in absorbing more light in all weather conditions.

10.3.6 Each module shall have low iron tempered glass front for strength & superior light transmission. It shall also have tough multi-layered polymer back sheet for environmental protection against moisture with high electrical insulation.

10.3.7 The module frame shall be made of aluminium or corrosion resistant material that shall be electrically & mechanically compatible with the structural material to be used for mounting the modules.

10.3.8 The solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with the thermal expansion properties of the Silicon cells and the module framing arrangement / material. The encapsulation arrangement shall ensure complete moisture proofing during life of the solar modules.

10.3.9 Solar module shall be laminated using lamination technology using established polymer (EVA) and Pedlar / Polyester laminate.

10.3.10 The PV modules used must qualify to the latest edition of IEC

STANDARD	DESRIPTION
IEC 61715	
IEC 61730-1Ed. 1.0	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Technical Specification
IEC 61730-1-1Ed. 1.0	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-1: Special requirements for testing of Crystalline Silicon photovoltaic (PV) modules
IEC 61730-1Ed. 2.0	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction
IEC 61730-2 Ed.2	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing
IEC 61701 Ed.2 & IEC 62716	Salt mist corrosion testing of photovoltaic (PV) modules (Applicable for coastal and marine environment)
IEC TS 62804-1:2015 Ed.1	Photovoltaic (PV) modules - Test methods for the Detection of potential-induced degradation - Part 1: Crystalline silicon under conditions of 85oC/85% RH for minimum 192 hours.
IEC 60068-2	Sand Storm Test
IEC 62716	Ammonia Corrosion Resistant Test
En 13501-1	Fire Resistance Test
As per the Solar Photovoltaic, Systems, Devices and Components Goods (Requirements for Compulsory Registration) Order, 2017, PV Modules used in the grid connected solar power projects shall be registered with BIS and bear the	

STANDARD	DESRIPTION
Standard Mark as notified by the Bureau of Indian Standards. Further, PV Modules should have been included in the ALMM list as per MNRE Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirements for Compulsory Registration) Order, 2019.	

10.3.11 Modules shall be PID-free

10.3.12 Photo conversion efficiency of SPV Module shall not be less than 18%. Module shall be made of high transmittance glass front surface giving high encapsulation gain.

10.3.13 The PV modules should have lowest temperature coefficient and positive power tolerance. Negative power tolerance shall not be accepted.

10.3.14 Module rating is considered under standard test conditions; however Solar Modules shall be designed to operate and perform under site conditions.

10.3.15 All materials to be used shall have a proven history of reliability, light weight and stable operation in external outdoor applications and shall have service life of more than 25 years

10.3.16 Solar PV Module design shall conform to following requirement:

a. Weather proof DC rated MC connector and a lead cable coming out as a part of the module, making connections easier and secure, not allowing any loose connections.

b. Resistant to water in grace, abrasion, hail impact, humidity & other harsh environmental factors for the worst situation at site.

10.3.17 PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 12 years and 80% at the end of 25 years.

10.3.18 The fill factor of module shall not be less than 0.70 (typical).

10.3.19 The V-I curve of each PV module with Sl. Nos. shall be submitted along with Modules meeting the required specifications.

10.3.20 Component Specifications

a) The PV Modules glass panel shall be:

(i) For PV Modules with back sheet, toughened low iron glass with minimum thickness of 4.0 mm for 72 cell module and 3.2 mm for 60 cell module for multi or mono-crystalline modules

(ii) In case of glass-glass Modules, glass thickness on each side shall be minimum of 2 mm. It shall be laminated using a laminator with symmetrical structure, i.e. heating plates on both sides.

(iii) The glass used shall have transmittance of above 90%.

b) The back sheet used in the PV modules shall be of three-layered structure durable for humid – hot conditions with properties of moisture barrier, elongation retention and UV resistance. The back sheet shall have the following properties.

Parameter Value	Value
Material thickness	≥ 300 micron
Water vapour transmission rate	< 2 g/m^2/day
Partial discharge test voltage	≥ 1000 V / 1500 V
Elongation at break	> 100%
Adhesion strength with encapsulant	> 70 N/cm
Interlayer adhesion strength	> 5 N/cm

c) The Employer reserves the right to conduct Pressure Cooker (PC) test/ Highly Accelerated Stress Test (HAST) to confirm the durability of the back sheet in accelerated conditions

d) The encapsulant used for the PV modules should be UV stable and PID resistant in nature. No yellowing of the encapsulant with prolonged exposure shall occur. The encapsulant shall have the following properties.

Parameter Value	Value
Gel content	> 75%
Volume resistivity	> 1×10^{15} Ω.cm
Peeling strength with glass	> 60 N/cm

e) The sealant used for edge sealing of PV modules shall have excellent moisture ingress protection with good electrical insulation (Break down voltage >15 kV/mm) and with good adhesion strength. Edge tapes for sealing are not allowed.

f) The module frame shall be made of anodized Aluminium, which shall be electrically & chemically compatible with the structural material used for mounting the modules.

10.3.21 Identification and Traceability:

Each PV module shall have RF identification tag. The following information must be mentioned in the RFID used on each module. This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.

i) Name of the manufacturer of PV module

ii) Name of the manufacturer of Solar cells

iii) Type of the Cell Mono or Poly

iv) Month and year of the manufacturer (Separately for Solar cell and module)

v) Country of origin (Separately for Solar cell and module)

vi) I-V curve for the module

vii) Wattage, Im, Vm and FF for the module

viii) Unique Serial No and Model No of the module

ix) Date and year of obtaining IEC PV module qualification certificate

x) Name of the test lab issuing IEC certificate

xi) Other relevant information on traceability of Solar cell and module as per ISO 9000 series.

10.3.22 Bidder shall provide data sheet for Solar PV Module (Under Standard Testing Condition) along with their offer as per Guaranteed Technical Particular

10.3.23 Marking:

Each PV module used in any solar power project must use a RF identification tag. The following information must be mentioned in the RF ID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.) and also in clear and indelible markings:

- Name, monogram or symbol of manufacturer of PV module;
- Name, monogram or symbol of manufacturer of Solar cells;
- Unique Serial number and model number of the module;
- Polarity of terminals or leads (colour coding is permissible)
- Maximum system voltage for which the module is suitable;
- Date & place (country of origin) of manufacture (separately for PV module and solar cell)
- I-V Curve for the module;
- Wattage, Im, Vm &FF for the module;
- Name of the test lab issuing IEC certificate;
- Other relevant information on traceability of solar cells and module as per ISO 9000 series.

10.3.24 The 14 MW Solar PV power plants shall continuously measure solar radiation, ambient temperature, wind speed and other weather parameters, generation of DC power as well as AC power generated from the plant.

10.3.25 Bidder shall provide data sheet for Solar PV Module (Under Standard Testing Condition) along with their offer as per Guarantee Technical Particular (Bid Response sheet -10).

10.3.26 Warranty

a) PV modules must be warranted with linear degradation rate of power output except for first year (up to 2% including LID) and shall guarantee minimum 80% of the initial rated power output at the end of 25 years.

b) The modules shall be warranted for minimum of 10 years against all material/ manufacturing defects and workmanship.

c) *The above warranties shall be backed by third party insurance for 25 years in fav*our of OIL.

10.3.27 Approval

(i) The Contractor shall provide commercial datasheet and Guaranteed Technical Particulars datasheet.

(ii) The Contractor shall provide the Bill of Materials (BOM) of the module that is submitted for approval along with the datasheets of each component. The component datasheet shall contain all the information to substantiate the compliance for component specifications mentioned above. The Contractor shall also provide complete test reports and certifications for the proposed module type/ BOM combination. For clarity, the BOM proposed shall be the subset of Constructional Data Form (CDF)'s of all the test reports.

(iii) The Contractor shall submit a detailed QAP of the Module with list of tests performed during Production supervision, Pre-Shipment Inspection, Laboratory Tests.

(iv) The Contractor shall obtain the approval of the proposed module make & model prior to manufacturing/ inspection call.

10.3.28 Manufacturing and Inspection

(i) The Contractor shall inform the module manufacturing schedule to the Employer at least 7 (seven) working days before the start of proposed schedule.

(ii) The Employer shall perform material inspection at the Manufacturer's factory before the start of proposed manufacturing schedule. Proof of procurement of components as per the approved BOM mentioning manufacturer name, manufacturing date and relevant test certificate shall be submitted during material inspection for verification.

(iii) The Manufacturing shall start only after the clearance by the Employer after the material inspection.

(iv) The cells used for module making shall be free from all defects like edge chipping, breakages, printing defects, discoloration of top surface etc. Only Class A solar cell shall be used.

(v) The modules shall be uniformly laminated without any lamination defects.

(vi) Current binning of modules shall be employed so that current mismatch of modules in a pallet does not exceed 0.1 A. Different colour codes shall be provided on the modules as well as pallet for identification of different bins. Maximum three nos. of bins will be allowed for each Module rating.

(vii) Pre-dispatch inspection of modules shall be performed as per the inspection protocol (to be provided by bidder).

10.3.29 Transportation, Handling, Storage and Installation

(i) Transportation, handling, storage and installation of modules shall be in accordance with the manufacturer manual so as not to breach warranty conditions. The Standard Operating Procedure (SOP) for the same shall be shared by the Contractor prior to dispatch for approval.

(ii) It is required to construct a temporary platform (graded) while keeping the modules at least above the highest flood level. If the contractor scheduled/ planned to mount the modules immediately after the receipt at site, then the module shall be kept in common storage area with proper arrangement.

(iii) The stacked modules, in any case, shall be stacked as per the manufacturer's recommendation only and shall be covered with tarpaulin sheet.

10.4 STRING COMBINER BOX OR ARRAY JUNCTION BOXES:

Standards and Codes

Standard / Code	Description
IEC 60529	Enclosure Ingress Protection
IEC 62262	Enclosure Impact Protection
IEC 60269	Fuse
IEC 61643-11	Surge Protection Device
IEC 62852 or EN 50521	Solar cable connector
IEC 60695-2-11	Fire hazard testing

10.4.1 Construction

SCB enclosure shall be made of UV resistant, fire retardant, thermoplastic material.

Enclosure degree of protection shall be at least IP65 and mechanical impact resistance shall be at least IK08.

Not more than two strings can be connected in parallel to a single input of SCB. One spare input terminal along with connector shall be provided for each SCB.

Every SCB input shall be provided with fuses on both positive and negative side. In case of negative grounded system, fuse at positive side only is acceptable. The rating of the fuses shall be selected such that it protects the modules from reverse current overload. The fuses shall be 'SPV' type conforming to IEC 60269-6.

DC switch disconnectors of suitable rating shall be provided at SCB output to disconnect both positive and negative side simultaneously.

Type-II surge protective device (SPD) conforming to IEC 61643-11 shall be connected between positive/negative bus and earth.

Resistance Temperature Detector (RTD) type or semiconductor type temperature sensor shall be provided to monitor the cabinet temperature.

MC4 connector conforming to IEC 62852 or EN 50521 shall be provided at each SCB input. Cable gland (double compression metallic) of suitable size for DC cables shall be provided at the SCB output.

UV resistant printed cable ferrules for solar cables & communication cables and punched / embossed aluminium tags for DC cables shall be provided at cable termination points for identification.

Suitable communication interface shall be provided to communicate the data to SCADA. The following parameters shall be measured/ monitored and made available at SCADA.

i) String current

ii) Bus voltage

iii) Output current

iv) Cabinet temperature

v) DC disconnect or switch ON/OFF status

vi) SPD operating status

10.4.2 Warranty

The SCB unit shall be warranted for minimum of 5 (five) years against all material / manufacturing defects and workmanship.

10.4.3 Tests

Routine tests and acceptance tests for the assembled unit shall be as per the Quality Assurance Plan (QAP) approved by the Employer.

10.5 **Power Conditioning Unit**

10.5.1 Standards and Codes

Power Conditioning Unit (PCU) shall comply with the specified edition of the following standards and codes.

STANDARD	DESCRIPTION
IEC 61683 Ed. 1	Photovoltaic systems - Power conditioners - Procedure for measuring efficiency
IEC 62109-1 Ed. 1	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements
IEC 62109-2 Ed. 1	Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters
IEC 61000-6-2 Ed. 2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments
IEC 61000-6-4 Ed. 2.1	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

STANDARD	DESCRIPTION
IEC 62116 Ed. 2	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
IEC 61727:2004 Ed. 2	Photovoltaic (PV) systems - Characteristics of the utility interface
IEC 60068-2-1:2007	Environmental testing - Part 2-1: Tests - Test A: Cold
IEC 60068-2-2:2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing - Part 2-14: Tests - Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)
CEA Technical Standards for Connectivity to the Grid Regulations 2007 with 2013 Amendment As per the Solar Photovoltaic, Systems, Devices and Components Goods (Requirements for Compulsory Registration) Order, 2017, Inverters used in the grid connected solar power projects shall be registered with BIS and bear the Standard Mark as notified by the Bureau of Indian Standards.	

10.5.2 Technical Requirements

Parameter	Specification
Rated AC power	As per design
Maximum input voltage	1000 V / 1500 V
Rated AC output voltage	As per design
Tolerance on rated AC output voltage	+/-10%
Rated frequency	50 Hz
Operating frequency range	47.5 Hz to 52 Hz
Power factor control range	0.9 lag to 0.9 lead
European efficiency	Minimum 98%
Maximum loss in Sleep Mode	0.05% of rated AC power
Total Harmonic Distortion	Less than 3% at 100% load
Degree of protection	IP 20 (Indoor)/IP 54 (Outdoor)

10.5.3 The rated / name plate AC capacity of the PCU shall be AC power output of the PCU at 50°C.

10.5.4 Maximum power point tracker (MPPT) shall be integrated in the PCU to maximize energy drawn from the Solar PV array. The MPPT voltage window shall be sufficient enough to accommodate the output voltage of the PV array at extreme temperatures prevailing at site.

10.5.5 The PCU output shall always follow the grid in terms of voltage and frequency. The operating voltage and frequency range of the PCU shall be sufficient enough to accommodate the allowable grid voltage and frequency variations.

10.5.6 Construction

10.5.6.1 Power Conditioning Unit (PCU) shall consist of an electronic three phase inverter along with associated control, protection, filtering, measurement and data logging devices.

10.5.6.2 Every DC input terminal of PCU shall be provided with fuse of appropriate rating and current measurement transducer. The combined DC feeder shall have suitably rated isolators for safe start up and shut down of the system.

10.5.6.3 Type-II surge protective device (SPD) conforming to IEC 61643-11 shall be connected between positive / negative bus and earth.

10.5.6.4 In case external auxiliary power supply is required, UPS shall be used to meet auxiliary power requirement of PCU. It shall have a backup storage capacity of 2 hours.

10.5.6.5 Circuit Breaker of appropriate voltage and current rating shall be provided at the output to isolate the PCU from grid in case of faults.

10.5.6.6 The PCU shall be tropicalized and the design shall be compatible with conditions prevailing at site. Suitable number of exhaust fan with proper ducting shall be provided for cooling keeping in mind the extreme climatic condition of the site as per the recommendations of OEM to achieve desired performance and life expectancy. The Contractor shall submit CFD analysis for ventilation requirement.

10.5.6.7 All the conducting parts of the PCU that are not intended to carry current shall be bonded together and connected to dedicated earth pits through protective conductor of appropriate size. DC negative terminal shall be grounded.

10.5.6.8 Dedicated communication interface shall be provided to monitor the PCU from SCADA.

10.5.6.9 PCU front panel shall be provided with LCD / LED to display all the relevant parameters related to PCU operation and fault conditions. It shall include, but not limited to, the following parameters.

i) DC input power
ii) DC input voltage
iii) DC input current
iv) AC output power
v) AC output voltage (all the 3 phases and line)
vi) AC output current (all the 3 phases and line)
vii) Frequency
viii) Power Factor

10.5.7 Operating Modes

Operating modes of PCU shall include, but not limited to, the following modes. These operating modes and conditions for transition are indicative only. The Contractor shall provide the detailed flow chart indicating the various operating modes and conditions for transition during detailed engineering.

10.5.7.1 Standby Mode

The PCU shall continuously monitor the input DC voltage and remain on Standby Mode until it reaches the pre-set value.

10.5.7.2 MPPT Mode

When the input DC voltage is above the pre-set value and AC grid connection conditions are fulfilled, the PCU shall enter into MPPT mode.

10.5.7.3 Sleep Mode

When the AC output power/DC input voltage decreases below the pre-set value for pre-set time delay, the PCU shall switch into Sleep Mode.

10.5.8 Protection Features

The PCU shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of PCU component failure or from parameters beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective devices.

The PCU shall provide protection against the following type of faults, among others.

i) DC/AC over current
ii) DC/AC over voltage
iii) DC reverse polarity
iv) DC earth fault
v) AC under voltage
vi) AC under frequency/over frequency
vii) Islanding
viii) Over temperature
ix) Lightning surges

10.5.9 **Grid Support Functions**

10.5.9.1 Active power regulation

The PCU shall be able to limit the active power exported to the grid based on the set point provided through PCU front control panel. The PCU shall also be able to automatically the limit the active power after an increase in grid frequency above a pre-set value. The ramp rate shall be adjustable during operation and start-up after

fault. The applicability of the requirement shall be as per CEA regulation and compliance.

10.5.9.2 Reactive power control

The PCU shall be able to inject / absorb reactive power to/ from the grid based on the set point provided through PCU front control panel. The same shall be performed automatically with adjustable ramp rate based on dynamic changes in grid voltage or reactive power reference.

10.5.9.3 Voltage Ride Through

The PCU shall remain connected to the grid during temporary dip or rise in grid voltage as per the LVRT and HVRT requirements of CEA Technical Standards for Connectivity to the Grid Regulations. The PCU shall also be able to inject reactive power during the period of voltage dip.

10.5.10 **Warranty**

The complete Power Conditioning Unit shall be warranted for minimum of 5 (five) years against all material / manufacturing defects and workmanship.

10.5.11 **Tests**

10.5.12 Type Tests

All the type test certificates as per the standards mentioned above shall be submitted for approval. The tests should have been conducted at a test laboratory compliant with ISO 17025 for testing and calibration and accredited by an ILAC / IECEE member signatory. Laboratory accreditation certificate or web link along with scope of accreditation shall also be submitted. It is the responsibility of the Contractor to substantiate the compliance for CEA Regulations using test reports.

10.5.13 Routine Tests

Routine tests and acceptance tests shall be as per the Quality Assurance Plan (QAP) approved by the Employer.

10.6 Inverter Transformer and Auxiliary Transformer

10.6.1 Standards and Codes

Inverter transformer and auxiliary transformer, wherever applicable, shall comply with the latest edition of the following standards and codes including amendments.

Standard	Description
IS 2026, IEC 60076	Specification of Power Transformers

IS 11171, IEC 60076	Dry-Type Power Transformers
IS 2099, IEC 60137	Bushings for alternate voltage above 1000 V
IS 335, IEC 60296	Insulating oil
IS 3639	Fittings and Accessories for Power Transformers

10.6.2 Technical Requirements

Parameters	Inverter Transformer	Auxiliary Transformer
VA Rating	As per system design requirement	
Voltage Ratio	33 kV / Inverter output voltage	As per system design
Duty, Service & Application	Continuous Solar Inverter application and converter Duty (Outdoor)	Continuous application
Winding	As per system design requirement	
Frequency	50 Hz	50Hz
Nos. of Phase	3	3
Vector Group & Neutral earthing	As per system / inverter manufacturer requirement	Dyn11
Cooling	ONAN	ONAN/ AN
Tap Changer	OCTC, No. of steps shall be as per the SLD and system requirement	
Impedance at 75°C	As per Inverter Manufacturer requirement	As per system requirement
Permissible Temperature rise over an ambient of 50°C (irrespective of tap)		
Top Oil	50°C	As per IS/IEC
Winding	55°C	As per IS/IEC
SC withstand time (thermal)	2 second	2 second
Short Circuit Apparent power	As per system requirement	
Termination	As per system requirement	
Bushing rating, Insulation class (Winding & bushing)	36 kV – porcelain bushings 1.1 kV – epoxy bushings	
Noise level	As per NEMA TR-1	
Loading Capability	Continuous operation at rated MVA on any tap with voltage variation of +/-3%, also transformer shall be capable of being loaded in accordance with IEC 60076-7	
Flux density	Not to exceed 1.9 Wb/sq.m. at any tap position with combined frequency and voltage variation from rated V/f ratio by 10% corresponding to the tap. Transformer shall also withstand	

Parameters	Inverter Transformer	Auxiliary Transformer
	following over fluxing conditions due to combined voltage and frequency fluctuations: a) 110% for continuous rating b) 125% for at least one minute c) 140% for at least five seconds. Bidder shall furnish over fluxing characteristic up to 150%	
Air Clearance	As per CBIP	

10.6.3 Construction

10.6.3.1 The transformer shall be provided with conventional single compartment conservator with prismatic toughened glass oil gauge. The top of the conservator shall be connected to the atmosphere through indicating type cobalt free silica gel breather with transparent enclosure. Silica gel shall be isolated from atmosphere by an oil seal. Inverter transformers shall be provided with Magnetic Oil Gauge (MOG) with low oil level alarm contact.

10.6.3.2 It is the responsibility of the Contractor to ensure that the inverter transformer comply with all the requirements of inverter provided by the inverter manufacture Inverter Transformer shall be designed for at least 5% total harmonic distortion (THD) to withstand distortion generated by the inverter as well as possible outside harmonics from the network.

10.6.3.3 The transformer shall be suitable for continuous operation with a frequency variation of ± 2.5% from nominal frequency of 50 Hz without exceeding the specified temperature rise.

10.6.3.4 Inverter Transformer shall have shield winding between LV & HV windings. Each LV winding must be capable of handling non-sinusoidal voltage with voltage gradient as specified by the inverter manufacturer. Also, shield winding shall be taken out from tank through shield bushing and the same shall be brought down to the bottom of the tank using copper flat and support insulator for independent grounding.

10.6.3.5 Neutral bushing of Inverter duty transformer shall be brought outside the tank for the testing purpose. It shall be covered with MS sheet and a sticker “For testing purpose only. Do not earth”. Neutral bushing of auxiliary transformer shall be brought outside the tank for earthing.

10.6.3.6 Transformer shall have 150 mm dial type Oil Temperature Indicator (OTI) and Winding Temperature Indicator (WTI) with alarm and trip contacts. All indicators shall have accuracy of 1.5%. For inverter transformers, WTI shall be provided for all the windings.

10.6.3.7 The radiators shall be detachable type, mounted on the tank with shut off valve at each point of connection to the tank, lifts, along with drain plug/ valve at the bottom and air release plug at the top.

10.6.3.8 Marshalling Box shall be of sheet steel, dust and vermin proof provided with proper lighting and thermostatically controlled space heaters. The degree of protection shall be IP 55. Marshalling Box of all transformers shall be preferably Tank

Mounted. One dummy terminal block in between each trip wire terminal shall be provided. At least10% spare terminals shall be provided on each panel. The gasket used shall be of neoprene rubber. Wiring scheme (TB details) shall be engraved in a stainless-steel plate with viewable font size and the same shall be fixed inside the Marshalling Box door.

10.6.3.9 Buchholz relay, double float type with alarm and trip contacts, along with suitable gas collecting arrangement shall be provided.

10.6.3.10 Inverter transformer shall be provided with spring operated Pressure Relief Device (with trip contacts) with suitable discharge arrangement for oil. For Auxiliary transformers, diaphragm type explosion vent shall be provided.

10.6.3.11 Filter valve at top the tank and drain cum sampling valve at bottom of the tank shall be provided.

10.6.3.12 All external surface of the transformer shall be painted with two coats of epoxy-based paint of colour shade RAL 7032. Internal surface of cable boxes and marshalling box shall be painted with epoxy enamel white paint. The minimum dry film thickness (DFT) shall be 100 microns.

10.6.3.13 LV and HV cable box shall be provided with disconnecting chamber to facilitate the movement of transformer without disturbing cable box and termination.

10.6.3.14 Air release plug, bi-directional wheel/skids, cover lifting eyes, transformer lifting lugs, jacking pads, towing holes, core and winding lifting lugs, inspection cover, rating plate, valve schedule plate, accessories and terminal marking plates, two nos. of earthing terminals shall be provided.

10.6.3.15 Rain hoods to be provided on Buchholz, MOG & PRD. Entry points of wires shall be suitably sealed.

10.6.3.16 The accessories listed above are indicative only. Accessories which are not mentioned above but required for satisfactory operation of the transformers are deemed to be included in the contract without extra charges. Fire-protection for inverter transformer shall be provided in accordance with relevant CEA regulations as amended time to time.

10.6.4 Warranty

The transformer shall be warranted for minimum of 5 (five) years against all material / manufacturing defects and workmanship.

10.6.5 Testing and Inspection

10.6.5.1 Type Tests and Special Tests

The following type test and special test reports shall be submitted during detailed engineering. The tests should have been conducted on the similar transformer by NABL accredited laboratory.

a) Type Tests

i. Lightning impulse (Full & Chopped Wave) test on windings as per IEC 60076-3

ii. Temperature Rise test at a tap corresponding to maximum losses as per IEC 60076-2

b) Special Tests

i. Measurement of zero-sequence impedance as per IEC 60076-1

ii. Measurement of harmonics of no-load current as per IEC 600761

iii. Measurement of acoustic noise level as per NEMA TR-1

iv. Short-circuit withstand test as per IEC60076-5

In case the contractor is not able to submit the test reports during detailed engineering, the contractor shall submit the reports of type/special tests either conducted by NABL accredited laboratory or witnessed by Employer.

1. Routine Tests

Each completed transformer shall be subjected to following routine tests as per the latest edition of IEC 60076 unless specified otherwise.

i) Measurement of winding resistance at each tap
ii) Measurement of voltage ratio between HV and LV windings at each tap
iii) Check of vector group
iv) Measurement of no-load loss and no-load current
v) Measurement of short-circuit impedance and load loss
vi) Magnetic balance test as per CBIP manual publication no. 295
vii) Separate source voltage withstand test
viii) Induced over voltage withstand test Measurement of insulation resistance
ix) Marshalling box functional test
x) IR Measurement on wiring of marshalling box
xi) Breakdown voltage test on transformer oil as per IS 335
xii) Oil leakage test on completely assembled transformer along with radiators

2. Tests at Site

After erection at site all transformer(s) shall be subjected to the following tests.

i) Measurement of voltage ratio

ii) Check of vector group

iii) Magnetic balance test

iv) Measurement of insulation resistance

v) Breakdown voltage test on transformer oil

In case the equipment is not found as per the requirements of the Technical Specifications of NIT, all expenses incurred during site testing will be to the Contractor's account and the equipment shall be replaced by him at free of cost.

10.7 **HT Switchgear**

a) Standards and Codes

All equipment provided under HT switchgear shall comply with latest editions and amendments of the relevant IEC standards and IS codes. In particular, the switchgear shall comply with the following standards and codes.

Standard / Code	Description
IS/IEC 62271-1	High Voltage Switchgear and Control gear - Part 1: Common Specifications
IS/IEC 62271-100	High Voltage Switchgear and Control gear - Part 100: AC Circuit Breakers
IS/IEC 62271-102	High Voltage Switchgear and Control gear - Part 102: AC Disconnectors and Earthing Switches
IS/IEC 62271-200	High Voltage Switchgear and Control gear - Part 200: AC Metal Enclosed Switchgear and Control gear for Rated Voltages Above 1 kV and Up to and Including 52 kV
IEC 61869	Instrument Transformers
IS 3231	Electrical relays for power systems protection
IEC 60255	Measuring relays and protection equipment
IEC 61850	Communication networks and systems for power utility automation
IEC 61131-3	Programmable controllers - Part 3: Programming languages
IS 9385	High voltage fuses
IS 9431	Indoor post insulators of organic material for systems with nominal voltages greater than 1000 V up to and including 300 kV
IEC 60099-4	Surge arresters - Part 4: Metal-oxide surge arresters without gaps for A.C. systems
IS 3070-3	Lightning Arresters for Alternating Current Systems - Part 3: Metal Oxide Lightning Arresters Without Gaps
IEC 62052-11	Electricity metering equipment (A.C.) - General requirements, tests and test conditions - Part 11: Metering equipment
IEC 62053	Electricity metering equipment (A.C.) - Particular requirements

b) Technical Parameters

Parameter	Specification
System Parameters	
Highest system voltage	36 kV
Rated system voltage	33 kV
Rated frequency	50 Hz
Number of phases	3
Power frequency withstand voltage	70 kV (r.m.s.)
Lightning impulse withstand voltage	170 kV (peak)
System fault current	As per system requirement
Circuit Breaker	
Type	Vacuum type
Operating duty cycle	O – 0.3sec – CO – 3min – CO
Short circuit breaking current	As per system requirement
Short circuit making current	2.5 times S.C. breaking current
Re-strike performance class	C2
Mechanical endurance class	M1
Current Transformer	
Accuracy class	0.2 for metering (0.2s for metering at outgoing feeder), 5P20 for protection
Rated VA burden	As per requirement
Insulation class	Class F
Voltage Transformer	
Accuracy class	0.2 for metering, 3P for protection
Rated VA burden	As per requirement
Insulation class	Class F

10.7.1 Switchgear Panel

1. The switchgear panel shall be free standing, floor mounted, single front, single tier fully compartmentalized, metal enclosed construction. Each panel shall have separate compartments for circuit breaker, bus bars, cable termination and auxiliary circuit.

2. The circuit breakers shall be mounted on horizontally withdraw able trucks with locking facility in SERVICE and TEST positions.

3. The panel enclosure shall be constructed with CRCA Steel / Aluzinc sheet. The thickness of load bearing members shall be minimum 3 mm and that of non-load bearing members shall be minimum 2 mm.

4. All surfaces shall be painted with two coats of epoxy-based paint of colour shade RAL 7032. The minimum dry film thickness (DFT) shall be 100 micron.

5. The circuit breaker and auxiliary circuit compartments provided on the front side shall have separate concealed hinged doors. Cable and bus bar compartments provided on the rear side shall have separate bolted covers. All doors and covers shall be provided with neoprene / synthetic rubber gaskets to prevent entry of vermin and dust.

6. Pressure relief device shall be provided in each high voltage compartment of a panel to safely vent the gases in the event of internal arc. Seal-off bushing arrangement shall be provided between the breaker compartment and bus bar / cable compartments to prevent transfer of arc from one compartment to other.

7. Automatic safety shutters shall be provided to cover up the fixed high voltage contacts on bus bar and cable sides when the truck is moved to TEST position.

8. Degree of protection shall not be less than IP 5X for auxiliary circuit compartment. However, for remaining compartments it shall not be less than IP 4X. For outdoor panels, degree of protection shall not be less than IP 55. Particular to ensure the following.

   i. The breaker shall be operated only if it is in SERVICE or TEST position.

   ii. Movement of the breaker truck between SERVICE and TEST positions shall be possible only if the breaker is OFF.

   iii. It shall be possible to open the door only when the breaker is in TEST position.

9. Each switchgear panel shall be provided with thermostatically controlled space heaters, separately for breaker, cable and bus bar compartments, to prevent condensation within the compartment. The space heater shall be connected to 240V, 50 Hz, single phase AC supply through suitable switch and fuse.

10. 240 V, 5 A, SPN industrial socket-outlet with ON/OFF switch shall be provided in each panel.

11. Each panel shall be provided with LED lamp rated for 240 V, 50 Hz, single phase AC supply for interior illumination controlled by door switch.

12. Gapless, metal-oxide surge arrestors shall be provided between line and earth in cable compartment of the switchgear panel. Suitable lifting hooks shall be provided for each panel.

10.7.2 Circuit Breakers

1. Circuit breakers shall be of vacuum type. It shall comprise of three separate identical single pole units operated through the common shaft and shall be fully interchangeable both electrically and mechanically.

2. The circuit breaker operating mechanism shall be based on motor operated spring charging and it shall be re-strike free, trip free both electrically and mechanically, with anti-pumping feature.

3. The rated control voltage of the spring charging motor shall be 110 VDC/230 VAC. Closing coil shall operate at all values of voltages between 85% and 110% of rated voltage. Opening coil shall operate correctly under all operating conditions of the circuit breaker up to the rated breaking capacity and at all values of supply voltage between 70% and 110% of rated voltage.

4. The spring charging motor shall have adequate thermal rating such that continuous sequence of the closing and opening operations is possible as long as power supply is available to the motor. It shall also be possible to charge the spring manually and close the breaker in the event of failure of motor / control supply to motor. Operating handle shall be provided for charging the operating mechanism. After failure of control supply to the motor, one open-close-open operation shall be possible with the energy contained in the operating mechanism.

5. The motor rating shall be such that it requires not more than 30 seconds for full charging of the closing spring. Closing action of the circuit breaker shall compress the opening spring ready for tripping. When closing springs are discharged after closing the breaker, they shall be automatically charged for the next operation.

6. Mechanical indicators shall be provided to indicate OPEN/CLOSED positions of the circuit breaker and CHARGED / DISCHARGED positions of the closing spring. An operation counter shall also be provided. These indicators and counter shall be visible from the panel front door without opening it.

10.7.3 Relays

1. All relays shall be microprocessor based numerical type. However, auxiliary relays can be static or electromechanical type. The relays shall be flush mounted on panel front with connections from the inside.

2. Auxiliary voltage of the relays shall be 110 VDC and the relays shall be capable of operating continuously between 80 – 120% of auxiliary voltage.

3. All numerical relays shall have adequate number of freely configurable, optically isolated, Binary Inputs (BI) and potential free Binary Outputs (BO).

4. All numerical relays shall have minimum four no. of current inputs, three for phase current and one for earth current, suitable for CT secondary current of 1A. The current inputs shall be compatible with both residual connected CT and Core Balance CT (CBCT). In addition, numerical relay in main outgoing feeder shall have three no. of voltage inputs for Under Voltage/Over Voltage protection.

5. All I/O's shall have galvanic isolation. Analog inputs shall be protected against switching surges and harmonics.

6. Making, breaking and continuous capacity of the relay contacts shall be adequate enough for the circuits in which they are used.

7. The numerical relay shall have the following protection functions with at least two independent protection setting groups. The protection functions shall be selectable from any of the IEC characteristic curves.

   i. Definite time (DT) phase over current protection
   ii. Inverse Definite Minimum Time (IDMT) phase over current protection
   iii. Definite time (DT) earth fault current protection
   iv. Inverse Definite Minimum Time (IDMT) earth fault current protection
   v. Under Voltage protection
   vi. Over Voltage protection

8. Transformer feeder protection relay shall have provision for the following protection functions.

   i. Buchholz alarm & trip
   ii. Oil Temperature Indicator (OTI) alarm & trip
   iii. Winding Temperature Indicator (WTI) alarm & trip
   iv. Pressure Relief Valve (PRV) trip
   v. Magnetic Oil Gauge (MOG) alarm

9. All numerical relays shall have provision for measurement and storage of electrical parameters such as voltage, current, frequency, active power, reactive power etc.

10. The numerical relay shall be able to record faults and events in non-volatile memory.

    i. Fault record – At least 5 recent faults including the protection function operated, operating phase(s), voltages and currents along with date and time stamp.

    ii. Event record – At least 200 events with date and time stamp.

11. The numerical relay shall have trip circuit supervision facility to monitor the circuit breaker trip circuit both in pre-trip and post-trip conditions. The relay shall also be able to provide circuit breaker monitoring, CT and VT supervision.

12. The numerical relay shall have self-diagnostic feature with separate output contact for indication of any internal relay failure

13. The numerical relay shall have RS-232/RS-485/RJ-45/USB ports on front side for local communication with PC and on rear side for remote communication to SCADA system.

14. The numerical relay shall have feature for time synchronization through the SCADA System / networking.

15. The numerical relay shall be provided with backlit alphanumeric LCD to access protection settings, measurement parameters, fault and event records. Read and write access to protection settings shall be password protected.

10.7.4 Instrument Transformers

(i) Instrument transformers shall be completely encapsulated cast resin type, suitable for continuous operation at the ambient temperature prevailing inside the switchgear enclosure, when the switchgear is operating at its rated load and the outside ambient temperature is 50°C.

(ii) Polarity marks shall indelibly be marked on each instrument transformer and at the lead terminals at the associated terminal block.

(iii) Voltage transformers shall be single phase units. Bus voltage transformers shall be housed in a separate panel on withdrawable truck.

(iv) HRC fuses of suitable rating shall be provided on primary side of voltage transformers. For secondary side, four pole Miniature Circuit Breakers (MCB) shall be provided.

10.7.5 Earthing

a. An earth bus made of copper shall be provided throughout the length of the panel. It shall be bolted to the framework of each panel and brazed to each breaker earthing contact bar.

b. The earth bus shall have sufficient cross section to carry maximum fault current without exceeding the allowable temperature rise.

c. All non-current carrying conductors of the panel shall be connected to the earth bus.

d. All joints to the earth bus shall be made through at least two bolts. Hinged doors shall be earthed through flexible earthing braid of adequate cross section. Suitable provision shall be provided at each end of the earth bus for connection with Owner's Earth conductor.

e. Positive earthing of the breaker truck and frame shall be maintained when it is in the connected position and in all other positions whilst the auxiliary circuits are not totally disconnected.

1. All metallic cases of relays, instruments and other panel mounted equipment shall be connected to earth bus by independent copper wires of size not less than 2.5 sq. mm with green colour insulation.

2. Instrument transformer secondary neutral point shall be earthed at one place only on the terminal block. Such earthing shall be made through links so that earthing of one circuit may be removed without disturbing the earthing of other circuits.

3. Separate earthing trucks shall be provided for earthing of busbars and incoming/outgoing feeders. The trucks shall have voltage transformer to indicate presence of voltage prior to earthing. An audible alarm shall also be provided in case of voltage on the earthing terminal. Integral earth switches may also be considered instead of earthing trucks. The earthing truck/switch shall have short circuit withstand capability equal to that of the associated switchgear panel.

4. The interlocks shall be provided to ensure the following.

i. It is not possible to rack-in the earthing truck / close the earthing switch when the breaker truck is in SERVICE position.

ii. It is not possible to rack-in the breaker truck into SERVICE position when earthing truck is connected/earthing switch is in closed position.

10.7.6 Bus bar

1. Bus bar shall be made of copper or aluminium with uniform cross section throughout their length. They shall be adequately supported on insulators to withstand electrical and mechanical stresses due to specified short circuit current.

2. All bus bars joints shall be thoroughly cleaned and anti-oxide grease shall be applied.

3. Plain and spring washers shall be provided to ensure good contacts at the joints and taps. Wherever aluminium to copper connections are required, suitable bimetallic connectors or clamps shall be used.

4. Bus bars shall be provided with heat shrinkable sleeves of suitable insulation class throughout their length with proper colour coding. All bus bar joints and taps shall be shrouded.

5. Bus bar support insulators shall be made of non-hygroscopic, arc and track resistant, high strength material suitable to withstand stresses due to over voltage and short circuit current.

6. The Contractor shall submit busbar sizing calculation for specified continuous and short time current ratings during detailed engineering.

10.7.7 Measuring Instruments

1. All the measuring instruments shall be digital, flush mounting type with communication facility.

2. All feeders except main outgoing feeder shall be provided with digital Multi-Function Meter (MFM). Tri Vector Meter (TVM) shall be provided for the main outgoing feeder (in the HT Panel). Accuracy class of MFM shall be 0.2 and that of TVM shall be 0.2S.

3. Measuring instruments shall have provision to display the following parameters.

   i. Line and phase voltages
   ii. Line and phase currents
   iii. Active power, Reactive power, Apparent power
   iv. Frequency
   v. Power factor
   vi. Total Harmonic Distortion (THD)

10.7.8 Wiring and Terminal blocks

1. All internal wiring shall be done with 650 V grade, 1.5 sq.mm. PVC insulated stranded flexible copper wire. For CT secondary circuits, 2.5 sq.mm copper wire shall be used.

2. Wire terminations shall be made with solder less crimping type tinned copper lugs, which shall firmly grip the conductor. Insulation sleeves shall be provided at all the wire terminations.

3. Printed identification ferrules, marked to correspond with panel wiring diagram shall be provided at both ends of each wire. The ferrules shall be firmly located on each wire so that they cannot move or turn freely on the wire. Wire identification shall be done in accordance with IS 11353.

4. The Contractor shall be solely responsible for the completeness and correctness of the internal wiring and for the proper functioning of the connected equipment.

5. All internal wiring to be connected to the external equipment shall terminate on terminal blocks. Terminal blocks shall be rated for 650 V, 10 A and made of non-inflammable material.

6. CT and VT secondary circuits shall be terminated on stud type, disconnecting terminal blocks.

7. At least 10% spare terminals shall be provided on each panel and these spare terminals shall be distributed on all terminal blocks.

10.7.9 Warranty

The HT panel unit shall be warranted for minimum of 5 (five) years against all material / manufacturing defects and workmanship.

10.7.10 Testing and Inspection

1. Type Tests

The switchgear panel shall be of type tested design. The following type test reports shall be submitted during detailed engineering. The tests should have been conducted on the similar equipment by NABL accredited laboratory.

Test	Standard	Relevant IEC Code
Switchgear panel		
Dielectric tests		
Power frequency voltage test	IEC 62271-200	6.2.6.1
Lightning impulse voltage test	IEC 62271-200	6.2.6.2
Dielectric tests on auxiliary and control circuits	IEC 62271-200	6.2.10
Measurement of the resistance of the main circuit	IEC 62271-200	6.4.1
Temperature-rise tests	IEC 62271-200	6.5
Short-time withstand current and peak withstand current tests	IEC 62271-200	6.6

Test	Standard	Relevant IEC Code
Verification of the IP coding	IEC 62271-200	6.7.1
Verification of making and breaking	IEC 62271-200	6.101
capacities		
Mechanical operation test	IEC 62271-200	6.102
Internal arc test	IEC 62271-200	6.106
Circuit Breaker		
Mechanical operation test at ambient air temperature (M2 Class)	IEC 62271-100	6.101.2
Basic short-circuit test-duties	IEC 62271-100	6.106
Relays		
Vibration tests	IEC 60255-21-1	
Shock and bump tests	IEC 60255-21-2	
Seismic tests	IEC 60255-21-3	
Electromagnetic compatibility requirements	IEC 60255-26	
Product safety requirements	IEC 60255-27	
Common requirements	IEC 60255-1	
Functional requirements	Relevant parts of IEC 60255-100 series	
Communication requirements	IEC 61850	
Current Transformers		
Temperature-rise test	IEC 61869-2	7.2.2
Impulse voltage withstand test on primary terminals	IEC 61869-2	7.2.3
Tests for accuracy	IEC 61869-2	7.2.6
Short-time current tests	IEC 61869-2	7.2.201
Voltage Transformer		
Temperature-rise test	IEC 61869-3	7.2.2
Impulse voltage withstand test on primary terminals	IEC 61869-3	7.2.3
Electromagnetic Compatibility tests	IEC 61869-3	7.2.5
Test for accuracy	IEC 61869-3	7.2.6
Short-circuit withstand capability test	IEC 61869-3	7.2.301

In case the contractor is not able to submit the test reports during detailed engineering, the contractor shall submit the reports of type/special tests either

conducted by NABL accredited laboratory or witnessed by Employer.

2. Routine Tests

Routine tests and acceptance tests shall be as per the Quality Assurance Plan (QAP) approved by the Employer.

10.8 SOLAR & DC CABLES

a. Standards and Code

Cable	From	To	Conductor / Insulation	Voltage Rating	Applicable Standard
Solar	Module	SCB	Copper / XLPO	1.1 kV DC	IEC 62930 / EN 50618
Cable*				1.5 kV DC	
DC Cable	SCB	PCU	Copper or Aluminium / XLPE	1.1 kV DC / 1.5 kV DC	IS 7098
* Cable used for module interconnection shall also be referred as solar cable.					

Solar cable outer sheath shall be flame retardant, UV resistant and black in colour.

Solar cable with positive polarity should have marking of red line on black outer sheath.

DC cables shall be single core, armoured, Flame Retardant Low smoke (FRLS), PVC outer sheath conforming to IS 7098. DC cable with positive polarity should have marking of red line on black outer sheath.

In addition to manufacturer's identification on cables as per relevant standard, following marking shall also be provided over outer sheath.

i) Cable size and voltage grade

ii) Word 'FRNC/ FRLS' (as applicable) at every metre

iii) Sequential marking of length of the cable in meters at every meter

b. Cables shall be sized based on the following considerations:

i) Rated current of module

ii) The average voltage drop in the cables (Modules to Inverter) shall be limited to 1.5 % of the rated voltage. The Contractor shall provide voltage drop calculations in excel sheet.

iii) Short circuit withstand capability

iv) De-rating factors according to laying pattern

c. Warranty

The cables (Solar and DC) shall be warranted for minimum of 1 (one) year against all material/ manufacturing defects and workmanship.

d. Tests

Routine test and acceptance tests requirements shall be as per IEC 62930/EN 50618 for solar cables and IS 7098 for DC cables.

e. Installation

1. Cable installation shall be as per IS 1255.

2. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted.

3. Solar cables shall be provided with UV resistant printed ferrules and DC cables shall be provided with punched/ embossed aluminium tags. The marking shall be done with good quality letter and numbers of proper size so that the cables can be identified easily.

4. Cable terminations shall be made with properly crimped lugs and passed through cable glands at the entry & exit point of the cubicles. Bimetallic lugs shall be used for connecting Cu bus bar and Al cables or vice-versa.

5. Solar cables, wherever exposed to direct sunlight and buried underground, shall be laid through Double Wall Corrugated (DWC) HDPE conduits. The size of the conduit or pipe shall be selected on the basis of 40% fill criteria.

6. Solar cables shall be aesthetically tied to Module Mounting Structure using UV resistant cable-ties suitable for outdoor application.

7. A.C and D.C cables shall be kept in separate trenches. The horizontal and vertical clearances between power and communication cable shall not be less than 300mm.

The Bidder shall provide data sheet for Inverter along with their offer as per Guaranteed Technical Particular (Bid Response Sheet-11).

10.9 **AC Cables**

1. Standards and Codes

All AC Cables shall conform to the following standards and codes.

IS 7098	Cross-linked polyethylene insulated PVC sheathed cables, Part 1: For working voltage up to and including 1100 V
IS 7098	Cross-linked Polyethylene Insulated Thermoplastics Sheathed Cables Part 2: for Working Voltages from 3.3 kV up to and Including 33 k

2. All AC cables shall be flame retardant, low smoke (FRLS) type designed to withstand all mechanical, electrical and thermal stresses develop under steady state and transient operating conditions.

3. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. However, cable joints may be allowed if the route length is more than maximum available drum length subject to Employer's approval.

4. In addition to manufacturer's identification on cables as per relevant standard, following marking shall also be provided over outer sheath.

5. Cable size and voltage grade

   i. Warranty

   All cables shall be warranted for minimum of 1 (one) year against all material / manufacturing defects and workmanship.

   ii. Testing

   Routine test and acceptance tests requirements shall be as per relevant standards for all cable sizes.

   iii. Installation

6. Cable installation shall be as per IS 1255.

7. LT cable (from inverter to inverter transformer) shall laid through RCC cable trench with supports.

8. Cable terminations shall be made with properly crimped lugs and passed through cable glands at the entry & exit point of the cubicles. Bimetallic lugs shall be used for connecting Cu bus bar and Al cables or vice-versa.

9. All AC cables shall be provided with punched/embossed aluminium tags. The marking shall be done with good quality letter and numbers of proper size so that the cables can be identified easily.

10.10 Auxiliary Supply System

1. Scheme for Auxiliary supply system shall be submitted by contractor during detailed engineering for the approval by Employer.

2. It shall mainly comprise of auxiliary transformer, AC distribution board(s) (ACDB), Battery & battery charger system, emergency lighting network, Uninterrupted power supply (UPS), distribution cables and metering & protective devices

3. Following consideration shall be taken into account while sizing the auxiliary transformer:

   i. 20% future load margin

   ii. 20% design margin

   iii. Total connected load at 0.8 power factor

10.11 LT Switchgear

1. Standards and Codes

All equipment provided under LT switchgear shall comply with latest revisions and amendments of the relevant IEC standards and IS codes. In particular, the switchgear shall comply with the following standards and codes.

Standard / Code	Description
IEC 61439-1	Low-voltage switchgear and control gear assemblies - Part 1: General rules
IEC 61439-2	Low-voltage switchgear and control gear assemblies - Part 2: Power switchgear and control gear assemblies
IEC 60947-1	Low-voltage switchgear and control gear - Part 1: General rules
IEC 60947-2	Low-Voltage Switchgear and Control gear: Circuit Breakers
IEC 60947-3	Low voltage switchgear and control gear: Part 3 Switches, disconnectors, switch-disconnectors and fuse combination units
IEC 60947-4-1	Low-voltage switchgear and control gear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor- starters
IEC 60947-5-1	Low-voltage switchgear and control gear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices
IEC 62052-11	Electricity metering equipment (a.c.) - General requirements, tests and test conditions - Part 11: Metering equipment
IS 694	Polyvinyl chloride insulated unsheathed-and sheathed cables/ cords with rigid and flexible conductor for rated voltages - up to and including 450/750V
IEC 61869	Instrument Transformers
IS 3043	Code of practice for earthing
IEC 60255	Measuring relays and protection equipment - Part 1: Common requirements

2. Technical Parameters

System Details	
Rated system voltage	415 V ± 10%, 3 Phase, 50Hz, 4 wire, Neutral Solidly Earthed
Digital Multifunctional Meter (MFM)	
Accuracy class	0.5 class for main distribution board at main control room and 0.5 class for DB at inverter room(s)
Communication with SCADA	RS 485 communication with Modbus RTU
Current transformer (CT)	
Type	Cast Resin Bar Primary
Voltage class and frequency	650 V, 50 Hz

CT Secondary Current	1A
Class of insulation	Class F
Accuracy class & burden	
a) For Protection	5P20, 5VA PS Class for REF and core balance CT (CBCT)
b) For Metering	Class 0.5, 5VA (min)
Minimum primary earth fault current to be detected by CBCT	1A
Instrument Security Factor for metering CT	5
Voltage transformer (VT)	
Type	Cast Resin
Accuracy class	0.5
Rated Voltage factor	1.1 continuous, 1.5 for 30 seconds
Class of insulation	Class F
Moulded case circuit breaker (MCCB)	
Rated voltage	415 V
Release	Thermal-Magnetic/Microprocessor
Rated current	As per system requirement
Poles	4 poles
Rated insulation level	690 V
Rated ultimate and service short circuit breaking Capacity	As per system requirement
Rated Making capacity (as per system requirement)	2.1 x Short circuit breaking Capacity
Utilization category	A

3. Constructional Details

i. he panel shall be metal enclosed, free standing, floor mounted, modular type with compartmentalized construction having degree of protection of IP 2X (Indoor) as per IS/IEC 60529. All doors and covers shall be provided with neoprene gaskets to prevent entry of vermin and dust.

ii. All switches, push buttons etc. shall be operated front and shall be flush/semi-flush mounted.

iii. The panel shall be fabricated from 2 mm CRCA sheet steel for frame & load bearing surfaces. Partitions may be fabricated from 1.6 mm CRCA if no components are mounted on them.

iv. Cable entries shall be from bottom. The opening of cable entry shall be covered by 3mm thick gland plates with proper sealing to avoid water and rodent entry.

v. Earthing bus bar of suitable cross section shall be provided throughout the length of panel.

vi. The panel shall be duly wired with suitable size of 1.1 kV, PVC insulated cable and terminals shall be brought out for cable connections. 10% spare terminals subjected to minimum one of each rating shall be provided on each distribution switchgear. All wire shall have ferrules as per wiring diagram.

vii. The panel shall be painted with 2 coats of primer after pre-treatment and 2 coats of Polyurethane / epoxy paint with shade as decided by the Owner.

viii. The panel shall be of dead front construction suitable for front operated and back maintained functioning.

ix. 240 V, 5A, 3 pin industrial socket-outlet with ON/OFF switch shall be provided in each panel

x. Each panel shall be provided with LED lamp rated for 240 V, 50 Hz, single phase AC supply for interior illumination controlled by door switch.

xi. Suitable lifting hooks shall be provided for each panel.

xii. Each switchgear panel shall be provided with thermostatically controlled space heaters to prevent condensation within the enclosure. The space heater shall be connected to 240 V, 50 Hz, single phase AC supply through suitable switch and fuse.

xiii. Earth leakage relay with Core balance CTs (CBCT) shall be provided on main incoming feeders having phase CT ratio more than 50/1A. CBCT's shall be circular window type with window size based on the overall diameter of the cables, to be finalized during detailed engineering.

4. Warranty

Distribution panels (ACDB and DCDB) shall be warranted for minimum of 1 (one) year against all material/ manufacturing defects and workmanship

5. Testing

Routine test and acceptance tests requirements shall be as per relevant standards for all cable sizes.

10.12 Uninterrupted Power Supply

i. Standards and Codes

Standard/Code	Description
IEC 62040-1	Uninterruptible power systems (UPS) - Part 1: General and safety requirements for UPS
IEC 62040-2	Uninterruptible power systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements
IEC 62040-3	Uninterruptible power systems (UPS) - Part 3: Method of specifying the performance and test requirements

ii. General Requirements

1. The Uninterrupted Power Supply (UPS) system shall be designed to supply power to following loads (but not limited to).

   i) Data logger / SCADA
   ii) Fire Detection/ Alarm Panel
   iii) HMI of SCADA
   iv) Emergency Lighting
   v) Inverter's Auxiliary supply (if applicable)
   vi) HT panel auxiliary
   vii) CCTV

2. Sizing of UPS shall be done considering the above-mentioned load at power factor of 0.8 lagging inclusive of 10% design margin at 50 ˚C.

iii. System Description

1. The UPS shall automatically provide continuous, regulated AC power to critical loads under normal and abnormal conditions, including loss of input AC power. The UPS system shall consist of the following major equipment.

   i) UPS Module
      a. Insulated Gate Bipolar Transistor (IGBT) Converter
      b. Insulated Gate Bipolar Transistor (IGBT) Inverter
      c. Digital Signal Processor (DSP) using Pulse Width Modulation (PWM) for Direct Digital Control (DDC) of all UPS control and monitoring functions
      d. Static bypass switch

   ii) Battery system for 2 hours
   iii) Battery protective and disconnect device
   iv) Maintenance bypass switch
   v) Integrated UPS Communications Protocols capable of communicating with SCADA system

2. The UPS shall meet the following minimum specifications.

Parameter	**Specification**
Topology	Online double conversion UPS
Input	
Voltage	415 V ± 10% AC

Frequency	50 ± 5 Hz
Power factor	0.95
Output	
Voltage	230V ± 1% AC
Frequency	50 Hz
Power factor	0.8
Battery	
Type	Sealed, Maintenance-Free (AGM) battery
Capacity	100% UPS load for 2 hours
Monitoring and communication	
LED Indicators	Load on Inverter, Battery operation, Load on Bypass, Overload, LCD Fault, UPS Fault
Electrical contacts	Closing contacts for each of the following conditions: 1. Unit on Battery 2. Low Battery 3. Summary Alarm 4. UPS On 5. Input Fail
Local Display	LCD/ LED
SCADA communications	RS-232 & RS-485 Interface Port
Overall efficiency	>90%
Electrical Protection	Input / output under voltage, over temperature, overload, Short circuit, battery low trip

3. The UPS shall be forced air cooled by internally mounted fans. The fans shall be redundant in nature to ensure maximum reliability. The fans shall be easily replaceable without the use of special tools.

4. Contractor shall provide the Operation & Maintenance Manual and mandatory spare parts list along with the equipment

iv. Warranty

UPS shall be warranted for minimum of 5 (five) years and batteries shall be warranted for a minimum of 2 (two) years against all material/ manufacturing defects and workmanship.

v. Tests

1 Routine tests and acceptance tests on final product shall be done as per QAP approved by the Employer.

2 On completion of installation and commissioning of the equipment on site tests shall be carried out with the max. Available load, which does not exceed the rated continuous load. An on-site test procedure shall be submitted by contractor include a check of controls and indicators after installation of the equipment.

10.13 **Earthing**

i. Standards and Codes

Earthing system shall comply with latest revisions and amendments of the relevant IEC standards and IS codes. In particular, earthing system shall comply with the following standards and codes.

Standard	**Description**
IS 3043	Code of Practice for Earthing
IEEE 80	IEEE Guide for Safety in AC Substation Grounding
IEEE 142	IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems
Indian Electricity Rules	

ii. General Requirements

1. Earthing system shall be designed based on system fault current and soil resistivity value obtained from geo-technical investigation report. Earth grid shall be formed consisting of number of earth electrodes sufficient enough to dissipate the system fault current interconnected by earthing conductors.

2. The earth electrode shall be made of high tensile low carbon steel rod, molecularly bonded by high conductivity copper on outer surface with coating thickness not less than 250 micron as per relevant standards. Suitable earth enhancing material shall Earth conductors shall be made of copper bonded steel or galvanized steel of sufficient cross section to carry the fault current and withstand corrosion.

3. Earth conductors buried in ground shall be laid minimum 600 mm below ground level unless otherwise indicated in the drawing. Back filling material to be placed over buried conductors shall be free from stones and harmful mixtures. Earthing conductor shall be buried at least 2000 mm outside the fence of electrical installations.

4. Earth electrodes shall not be situated within 1.5m from any building whose installation system is being earthed. Minimum distance between earth electrodes shall be two times the driven depth of the electrode.

5. Transformer yard and switchyard fence shall be connected to the earth grid by GS flat and gates by flexible lead to the earthed post.

6. All welded connections shall be made by electric arc welding. For rust protection the welds should be treated with red lead compound and afterwards thickly coated with bitumen compound.

iii. Earthing of PV array field

1. All PV Modules, Module Mounting Structures (MMS) and String Combiner Box (SCB) structures in the PV array field shall be bonded to the earthing system by two distinct connections.

2. Each PV Module frame shall be earthed using copper wire of sufficient cross section.

3. The copper wire shall be connected to the earth hole provided in the module frame using suitable arrangement in line with the manufacturer recommendation. The earthing arrangement shall use stainless washers to prevent galvanic corrosion between aluminium frame and copper wire in order to achieve effective earthing, serrated washers shall be employed to penetrate the anodization layer of the module frame.

4. Continuous copper earthing wire shall be run to connect a group of modules and both ends of the loop shall be bolted to the DC earth grid using bimetallic lugs and stainless-steel fasteners. The copper earthing wire shall be routed in such a way to avoid physical contact with the module aluminium frame.

5. The connection between MMS and DC earth grid shall be bolted or welded. Portion of the MMS which undergoes welding at site shall be coated with two coats of cold galvanising and anti-corrosion paint afterwards.

6. Earth electrodes of the DC earth grid shall be uniformly distributed throughout the PV array field so that optimum earth resistance is offered to leakage current flowing from any module frame or MMS.

7. SCB equipment earthing point shall be connected to the DC earth grid using flexible copper cable of sufficient cross section as recommended by the manufacturer. The connection with the DC earth grid shall be done using suitable bimetallic lugs and stainless-steel fasteners.

iv. PCU Earthing

DC negative bus bar of the PCU shall be earthed to avoid Potential Induced Degradation (PID). DC negative bus bar and PCU equipment earth shall be bonded to the PCU earth bus and connected to earth electrodes through flexible copper cable of sufficient cross section as mentioned by the manufacturer.

v. Transformer Earthing

1. Inverter transformer neutral shall be floating, not to be earthed. However, recommendation of inverter manufacturer shall also be taken into account.

2. Transformer tank, cable box, marshalling box and all other body earth points shall be earthed.

3. Inverter transformer shield shall be earthed separately using minimum two no. of earth electrodes. Earthing conductor between shield bushing and earth electrodes shall be copper flat of suitable size not less than 25 x 6 mm

4. Neutral and body of the auxiliary transformer shall be earthed.

vi. Local and Main Control Room Earthing

1. Metallic enclosure of all electrical equipment inside the local and main control room shall be connected to the earth grid by two separate and distinct connections.

2. Cable racks and trays shall be connected to the earth grid at minimum two places using galvanized steel flat.

3. SCADA and other related electronic devices shall be earthed separately using minimum two no. of earth electrodes.

vii. Switchyard Earthing

The metallic frame work of all switchyard equipment and support structures shall be connected to the earth grid by means of two separate and distinct connections.

viii. Tests

On completion of installation, continuity of earth conductors and efficiency of all bonds and joints shall be checked. Earth resistance at earth terminations shall be measured and recorded.

The earth plate shall be provided to facilitate its identification and for carrying out periodical inspection.

10.14 **Lightning Protection System**

i. Lightning Protection System (LPS) for entire plant against direct lighting strokes shall be provided as per IEC 62305:2010 or NFC 17-102:2011

ii. Protection level for the entire plant shall be Level-I.

iii. LPS as per IEC 62305

Location of air terminals shall be designed as per rolling sphere method.

iv. LPS as per NFC 17-102

Lightning Protection System shall consist of following accessories.

a. Early Streamer Emission (ESE) air terminal
b. Highly insulated poly-plastic adaptor to fix the ESE air terminal with the FRP mast
c. Fiberglass Reinforced Plastic (FRP) mast
d. Coupler to connect FRP mast with GI mast
e. Galvanized Iron mast with base plate and guy wire kit
f. Down-conductor: PVC insulated flexible copper cable of suitable size complying with EN 501642 or equivalent standard. It shall be routed along the mast with suitable fixings and connecters
g. Test joint with each down conductor

h. Lightning event counter complying with EN 50164-6 or equivalent standard. It shall be fixed at suitable height in series with the down conductor

i. Earth termination system in accordance with NFC 17-102. Earth electrodes shall comply with the EN 50164-2 or equivalent standard. Earth enhancing compounds complying with EN 50164-7 or equivalent standard, may be used where soil resistivity is higher and making it impossible to achieve system resistance within specified limit.

v. Accessories listed above are indicative only and any other fittings or accessories, which are usual or necessary for satisfactory operation of the lightning protection shall be provided by the Contractor without extra charges.

vi. Necessary foundation/anchoring for holding the lightning mast in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.

vii. The product shall be warranted for minimum of 2 (two) years against all material/ manufacturing defects and workmanship.

viii. Type test reports as per IEC 62305:2010 or NFC 17-102:2011 shall be submitted during detailed engineering for approval.

10.15 **Communication Cables**

i. Optical Fibre Cables

Optic Fibre cable shall be 4/8/12 core, galvanized corrugated steel taped armoured, fully water blocked with dielectric central member for outdoor/ indoor application so as to prevent any physical damage.

ii. The cable shall have multiple single-mode or multimode fibres on as required basis so as to avoid the usage of any repeaters.

iii. The outer sheath shall have Flame Retardant, UV resistant properties and are to be identified with the manufacturer's name, year of manufacturing, progressive automatic sequential on-line marking of length in meters at every meter on outer sheath.

iv. The cable core shall have suitable characteristics and strengthening for prevention of damage during pulling.

v. All testing of the optic fibre cable being supplied shall be as per the relevant IEC, EIA and other international standards.

vi. The Contractor shall ensure that minimum 100% cores are kept as spare in all types of optical fibre cables.

vii. Cables shall be suitable for laying in conduits, ducts, trenches, racks and underground buried installation.

viii. Spliced/ Repaired cables are not acceptable. Penetration of water resistance and impact resistance shall be as per IEC standard.

ix. Communication Cable (Modbus)

1. Data (Modbus) Cable to be used shall be shielded type with stranded copper conductor. Cable shall have minimum 2 pair each with conductor size of 0.5 Sq.mm. Cable shall be flame retardant according to IEC 60332-1-2.
2. Cable shall be tested for Peak working voltage of not less than 300 V and shall be suitable for serial interfaces (RS 422 and RS 485).
3. Communication cable shall be laid through underground with suitable HDPE ducts.

10.16 **SCADA**

i. General Requirements

The Contractor shall provide complete SCADA system with all accessories, auxiliaries and associated equipment and cables for the safe, efficient and reliable operation and monitoring of entire solar plant and its auxiliary systems

ii. The Contractor shall provide all the components including, but not limited to, Hardware, Software, Panels, Power Supply, HMI, Laser Printer, Gateway, Networking equipment and associated Cables, firewall etc. Needed for the completeness.

iii. SCADA System shall have the provision to perform the following features and / or functions:

a. Web enabled Operator Dashboards: Showing key information on Generation, Performance and Current Status of various equipment in Single Line Diagram (SLD) format with capability to monitor PV array string level parameters.
b. Real time Data Logging with Integrated Analytics & Reporting: Logging of all parameters - AC, DC, Weather, System Run Hours, Equipment Status and Alarms as well as derived/ calculated/ integrated values. The SCADA User interface shall be customizable and enable Report Generation and Graphical Analysis.
c. Fault and System Diagnostics with time stamped event logging.
d. Support for O&M Activities: The interface shall allow integration with Surveillance System(s), Module Cleaning System and various other O&M support systems to provide a Data Analysis and Decision Support System for smooth and efficient Plant Operations.
e. AI based Distributed Analytics for Predictive Maintenance, trend analysis and Alerts.
f. Generate, store and retrieve user configurable Sequence of Event (SOE) Reports.
g. Interface with different field equipment in the plant and work seamlessly with field equipment supplied by different companies.
h. Transfer of plant data reliably, to an Owner designated server or Cloud on any kind of remote network including low bandwidth and wireless links such as 2G/3G/VSAT.

(Note: Telecom Lease line connection, if required for transferring data from Plant over internet shall be taken by Contractor in the name of Employer for O&M period) However, the Contractor shall provide a Package/ Split AC of suitable capacity decided by heat load requirement in SCADA room at Main Control Room.

iv. Architecture

1. The SCADA System shall be built over Industrial IoT architecture with integrated Analytics, secure web access, enterprise software and Database
2. Data acquisition shall be distributed across MCR and LCRs while plant level data aggregation shall be done in both local and remote server (as specified by Owner).
3. Analog and Digital IO modules shall have integrated processor for distributed IO processing and control.
4. Data communication system shall be built over fibre optic cables/ wireless network with high bandwidth TCP/IP communication (Fast Ethernet or 802.11 a/b/g/n) across all Inverter and Control Rooms with Internet/Intranet access at Main Control Room. Firewall shall be provided for network security.
5. Plant SCADA Server shall have Industrial Grade server hardware running SCADA & Monitoring Software with data storage (complete plant data) space for 2 years.
6. Plant data for monitoring and control operations should be accessible without dependence on external network.
7. A virtual/cloud server running SCADA & Monitoring Software shall be configured in parallel with Plant Server to enable easy access to plant data from outside the plant without having to login to plant server. Effectively, the plant data shall be replicated in both places i.e. between systems at the Plant Server and Remote Server to provide data redundancy for critical plant data.
8. Operator Workstation/PC shall be of Industrial Grade for browser-based access to plant data from Plant or remote server. Plant control & SLDC/Utility related operations shall only be initiated through browser-based interface requiring no client software or database to be installed on the Workstation. All critical software and Plant Data shall be installed/stored on local and remote servers only with user access control for protecting the software and data assets from accidental deletion or corruption.
9. Internet/Intranet at Plant: Public or private network access shall be provided at the plant through any broadband/VSAT connectivity of 2Mbps or higher bandwidth. In case no broadband/VSAT connectivity can be provided at the plant, a 3G/4G data card from any Internet Service Provider (ISP) may be provided. SCADA system shall be capable of sending all plant data in real time to the Remote Server.
10. GPS based Time Synchronization System:

    The SCADA system shall have a Master/Slave Clock system along with antenna, receiver, cabinet and internal interconnection cables. All SCADA controllers, servers, OWS and communicating equipment shall be synchronized to the GPS clock.

v. Industrial IoT Controllers & Data Acquisition

a. The Plant SCADA and Monitoring System may use one or more IIoT Controllers at each LCR and MCR for the purpose of data acquisition and data forwarding to the Local and Remote SCADA Servers. The IIoT Controllers shall meet the following minimum requirements:

b. The IIoT Controllers shall be distributed in nature and work independently of other IIoT Controllers or any central controller in the system.

c. Shall be capable of supporting wide range of field protocols to communicate with different field equipment (Modbus over RS485/Ethernet, etc.)

d. Shall have local storage for a minimum of 2 weeks (in case of network failure).

e. Provide web-based interface to configure the controller for various equipment in the field.

f. IO Functionality: Shall support status monitoring of VCBs & Trip relays on RMU / HT & Transformer panels through distributed DI/AI modules.

g. Controls:

   Shall be capable of controlling breakers (ON/OFF). Both ON/OFF and Parameter control of inverters shall be supported.

h. Data Communication with Servers: Shall send the data collected, from all the equipment at Inverter Control Room and/or Main Control Room, to the Monitoring & Control Server. Controllers shall be capable of sending data over Internet connections USB data cards.

i. Shall not require a static public IP address, at the plant for the purpose of remote access.

vi. <u>Functionalities</u>

a. The SCADA system shall monitor instantaneous and cumulative electrical parameters from all DC& AC Equipment including inverters, string combiner boxes, weather station, MFM, Transformer and Switchgear (LT & HT Panels) at regular intervals not greater than one minute.

b. The SCADA system shall monitor Instantaneous and cumulative environment parameters from weather sensors or data loggers at same interval as electrical parameters and provide PR, CUF on the fly.

c. The SCADA system shall provide Alarms and Alerts on equipment faults and failure in less than 5 seconds. Alarms on status change of hardwired DI shall also be provided.

d. The SCADA system shall provide configurable alerts on any parameter crossing settable thresholds. The list of such parameters shall be finalised in consultation with the Owner.

e. The SCADA system shall enable integration with other sub-systems at the plant for supporting O&M activities. The list shall include but not limited to:

vii. Surveillance Cameras,

viii. Module Cleaning System – For monitoring of water usage and efficacy of cleaning process.

a. The SCADA system shall have user-friendly browser-based User Interface for secure access from anywhere, for minimum ten concurrent connections from the Operator PC or other securely connected laptop/mobile, for plant monitoring, O&M, daily reporting, and analysis. A dashboard providing summary details of total plant generation, day's export, irradiance, Inverter Control Room level generation and performance indicators like PR and CUF.

b. Reporting: The SCADA system shall provide downloadable reports in Excel / PDF, configurable for equipment parameters across the plant.

c. The system shall have Configurable Analysis page for self-configured as well as on demand Analytics charts.

d. The SCADA system shall be extensible to include maintenance of O&M schedules and related activities for plant equipment as per the O&M Manual.

e. Connectivity shall be provided to Owner's Data Monitoring Centre. Data collected by Plant SCADA shall be replicated in real-time, using industry standard interfaces such as Web Services, OPC-UA, data files, as required – with Owner's Central Monitoring System Jodhpur. The data recording intervals for different parameters from different devices in the solar plant shall be considered when creating schedules to "push" the data from Plant SCADA to data receivers stationed at jodhpur

f. Mobile User Interface: summary of plant performance and issues should be accessible in a mobile Native UI or browser UI.

g. Data Communication to SLDC: SCADA system shall provide required interface to integrate with TRANSCO-SLDC, in compliance with grid code, to send any parameters specified by SLDC.

Note: The methodology and specification of SLDC interface will be provided separately by SLDC/TRANSCO and it shall be the responsibility of the Contractor to determine the same.

h. Power Plant Control: SCADA system shall provide required interface to the local SCADA operator to set various power control modes (active/reactive power/frequency/PF) through the inverters over industry standard communication protocols like Modbus over TCP/IP.

i. Forecasting and Scheduling: SCADA shall provide day ahead and week ahead forecasting and scheduling for power generation at the plant as per SLDC/Utility stipulations.

j. Predictive Maintenance: SCADA system shall have in-built or pluggable frameworks to support AI based Predictive Maintenance for all key equipment including inverters, transformers and switchgear at the plant.

k. All programming functionalities shall be password protected to avoid unauthorized modification.

l. The Contractor shall provide software locks and passwords to Employer for all operating & application software. Also, the Contractor shall provide sufficient documentation and program listing so that it is possible for the Employer to carry out modification at a later date.

ix. Cable Specifications

a. RS485 & IO Cables shall meet the following minimum specifications: For RS485: 0.5sq.mm ATC multi-strand (class-5), insulated core, twisted pair, overall screened with ATC drain wire, GI wire Armoured, PVC sheathed, DIN47100 colour standard, FRLS, 1.1 kV grade

b. For IO cabling (between HT/RMU panels and SCADA panel) – 1.0 sq.mm multi-strand, 4/8/12 core screened, armoured, FRLS cable, 1.1KV grade.

For Optical Cabling: 6F, Armored, Single/Multi mode laid through HDPE conduits to minimize cable breaks.

x. Earthing

a. Two isolated electronic earth pits near to SCADA panel at every Inverter and Control Room with < 1 Ohm resistance shall be provided. One earth pit shall be used for protective/body earth and the other to be used for Signal Earth.

b. Apart from providing separate earth pits, manufacturer specified earthing recommendations shall be followed for all communicating equipment connected to SCADA. This includes but is not limited to SMBs, Inverters, WMS and Switchgear panels.

xi. Communication Cable Laying

a. All RS485, IO and CAT6 cables shall be laid in separate conduits with a minimum separation of 1.5ft from AC/DC power cables all along.

b. Power cables shall be laid deep in the trenches first. Data cables shall be laid in separate conduits after partially filling the trenches to ensure minimum 1.5 ft. separation between power and communication cables all along the trench.

c. IO Cables between switch gear panels and SCADA panel shall be laid on separate cable trays, with a minimum of 1.5ft separation from trays carrying AC Power cables.

d. RS485 & CAT6 cables between switch gear panels or Inverters and SCADA panel shall be laid on separate cable trays, with a minimum of 1.5ft separation from trays carrying AC Power cables.

xii. Control Cabinets / Panels / Desks at Main Control Room

a. The cabinets shall be IP-22 protection class. The Contractor shall ensure that the temperature rise is well within the safe limits for system components even under the worst condition and specification requirements for remote I/O cabinets.

b. The cabinets shall be totally enclosed, free standing type and shall be constructed with minimum 2 mm thick steel plate frame and 1.6 mm thick CRCA steel sheet or as per supplier's standard practice for similar applications.

xiii. Software Licences

The Contractor shall provide software license for all software being used in Contractor’s System. The software licenses shall be provided for the project and shall not be hardware/ machine-specific.

xiv. Hardware at Main Control Room

a. The Hardware as specified shall be based on latest state of the art Workstations and Servers and technology suitable for industrial application & power plant environment.

b. The Local Monitoring & Control Server and the Operating Work station, to be deployed in the Plant Control Room, shall have the following server hardware and operating system along with accessories:

xv. Plant Server

Server Hardware	Hex / Octal Core Xeon, 32GB RAM (expandable to 64 GB RAM), 4 X 2TB SATA hard discs in RAID 5 configuration, 2TB external USB hard disc (for backup), dual power supplies, 2 LAN ports, LCD console, keyboard & mouse. The Server hardware shall be housed in a rugged fan-cooled, and rodent-proof Server Rack.
Operating System	Operating System and Database shall be of enterprise scale (RedHat Linux or equivalent Linux OS, Oracle / MySQL or equivalent DB), with required AMC for 5 years.
Accessories	Monitor: Min 22” LED Flat Monitor with on-interfaced refresh rate min. 75 Hz. Keyboard: ASCII type Pointing Device: Mouse Intelligent UPS (on line): Minimum 2 hour battery backup.
Operator Workstation	
Hardware	i7 CPU running at 3.0 GHz or faster with 8GBRAM, 500GB hard disk, 25” LED monitor, keyboard and mouse, 4 USB ports, LAN port
Operating System	Windows operating system with necessary tools, anti-virus software.
Accessories	Screen Display Unit: Min 50” LED Flat Monitor with wall mounted arrangement for the display of SCADA screen A4 size monochrome laser printer. UPS of required capacity with 2 hour battery backup.

All network components of LAN and Workstations shall be compatible to the LAN, without degrading its performance.

xvi. Factory Acceptance Test (FAT)

FAT procedure shall be submitted by bidder for approval. SCADA shall communicate with all third devices which are part of solar plant and same shall be demonstrated during the FAT.

10.17 **Power Evacuation System**

The contractor has to do the power evacuation and integration to and with the designated substation via either overhead transmission line or underground cables at

specified grid voltage with all necessary infrastructure such as protection switchgears and metering systems as per the requirement of the Employer.

The power evacuation system shall be as per DISCOM / TRANSCO requirement and appropriate approval. The contractor shall get route approval from the Employer or concerned authorities prior to start of the construction. Any changes in the route or scheme introduced by DISCOM/TRANSCO at any point of the time prior to commissioning shall be complied without any additional cost to the Employer.

The ROW for the TL/UG cable shall be obtained prior to the construction of the line from the concerned authorities.

i. Overhead Transmission Line

In case the power evacuation is planned with overhead transmission line for plant internal and external evacuation, the design of tower and its accessories shall be as per the DISCOM's requirement and the design shall be submitted to Employer for approval/ accord.

ii. Underground cable

In case the power evacuation is planned with underground cable for plant internal evacuation, the cable shall be approved by the Employer. However, in case of external power evacuation, the evacuation plan shall be as per DISCOM's requirement and the same shall be submitted to Employer for approval/ accord.

10.18 **Illumination**

a. Standards and Codes

LED luminaires shall be tested at independent laboratory as per the following test standards.

Standard / Code	**Description**
LM79-08	Electrical and Photometric Measurements of Solid-State Lighting Products
LM 80-15	Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules

b. General specification

This specification covers design, supply and installation of uniformly Illumination system along the peripheral & internal roads, main control room & inverter rooms, switchyard and other facilities including entry points/gate(s) inside the plant area.

The Contractor shall furnish Guaranteed Technical Particulars of the LED luminaires, from renowned brands available in the market for approval of Employer.

Lighting system shall work on the auxiliary supply and same shall be incorporated in auxiliary loads. The Contractor shall provide minimum 20% of total lighting points as emergency lighting points, fed from UPS DB or DCDB as per scheme adopted by the Contractor. Indoor and outdoor emergency lights shall be provided at each inverter room, main control room, security room and main gate.

c. Lighting Levels

The average LUX level of 10 lux is to be maintained in switchyard. However, a lux level of 20 lux ((10+10) additional switchable on requirement only) is to be maintained in switchyard on transformer.

The lighting system for outdoor and indoor areas of solar power plant shall be designed in such a way that uniform illumination is achieved. Average LUX level to be maintained in different areas shall be as under:

Area	LUX
Control Room and equipment rooms	300
Office	300
Battery & other rooms	150
Internal/Periphery Roads	4
Transformer yard/Switchyard	20
H – pole and metering point	10

The lighting level shall take into account appropriate light output ratio of luminaires, coefficient of utilization maintenance factor (of 0.7 or less) to take into account deterioration with time and dust deposition.

LED Luminaire for Outdoor Applications

LED luminaires shall meet the following parameters.

Parameter	Specified Value
Input voltage	170-260 V
Input Frequency	50 Hz +/- 1 Hz
Power Factor	0.90 (Minimum)
Luminous efficacy	>90 lumens per watt
Beam Angle	Minimum 120°
Total Harmonic Distortion	< 10 %
Working Humidity	10% - 90% RH (Preferably Hermetically sealed unit)
Degree of Protection	Minimum IP 65 (for Outdoor fixtures)
Luminaire Casing	Powder coated metal / Aluminium.
Color Temperature	5700 K (cool day light)
Color Rendering Index	>65
Moisture protection in case of casing damage	IP 65 (driver unit shall preferably be totally encapsulated)

The LED luminaire (outdoor) housing, heat sink, pole mounting bracket, individual LED reflectors and front heat resistant tempered glass should be provided.

The LED luminaire (outdoor) housing should be made of non-corrosive, high- pressure, die-cast aluminium and the housing should be power coated grey, so as to ensure good weather ability. Each individual LED source should be provided with an asymmetrical distribution high reflectance aluminized reflector, which should ensure that the light distribution of the luminaire is suitable for road lighting applications (wide beam distribution) and should ensure high pole to pole spacing.

The luminaire should be provided with in-built power unit and electronic driver.

The luminaire should be suitable for standard street light poles and should be suitable for side entry and bottom entry (post top).

GI Lighting pole of suitable diameter capable of withstanding system and wind load, shall be provided with average Zn coating thickness of 80micron. The street light poles shall have loop in loop out arrangement for cable entry and light fixture / wiring protected with suitably rated MCB.

All outdoor lighting system shall be automatically controlled by synchronous timer or photocell. Provision to bypass the timer or photocell shall be provided in the panel.

Lighting panels shall be earthed by two separate and distinct connections with earthing system. Switch boxes, junction boxes, lighting fixtures, etc. shall be earthed by means of separate earth continuity conductor. Cable armour shall be connected to earthing system at both the ends. Proper earthing of street light poles shall be ensured.

Junction box for lighting shall be made of fire-retardant material. The degree of protection shall be IP 55 for outdoor junction box

Lighting cables, wherever exposed to direct sunlight, shall be laid through Double Wall Corrugated (DWC) HDPE conduits.

d. LED Luminaire/Lamps for Indoor Applications

LED luminaire/lamps shall have minimum 3-star BEE rating.

All indoor LED luminaire/lamps shall be supplied with proper diffuser to avoid direct visibility of LED and suitable heat sink for longer life.

e. Warranty

All luminaires shall be warranted for minimum of 2 (two) years against all material / manufacturing defects and workmanship.

10.19 **Weather Monitoring System**

As a part of weather monitoring system, the Contractor shall provide the following measuring instruments with all necessary software and hardware required to integrate with SCADA.

1 Pyranometer

The Contractor shall provide secondary standard pyranometers (ISO 9060 classification) along with necessary accessories for measuring the incidental solar radiation at horizontal and inclined plane of array.

Specification of the pyranometer shall be as follows.

Parameter	**Specification**
Spectral Response	0.31 to 2.8 micron
Time response (95%)	Maximum 15s
Nonlinearity	± 0.5%
Temperature Response	± 2%
Tilt error	< ± 0.5%
Zero offset thermal radiation	±7 W/m^2
Zero offset temperature change	±2 W/m^2
Operating temperature range	0°C to +80°C
Non-stability	Maximum ± 0.8%
Resolution	Minimum +/- 1 W/m^2
Output	Analog output: 4 – 20 mA Serial output: RS 485

Each instrument shall be supplied with necessary cables. Calibration certificate with calibration traceability to World Radiation Reference (WRR) or World Radiation Centre (WRC) shall be furnished along with the equipment. The signal cable length shall not exceed 20 m. The Contractor shall provide instrument manual in hard and soft form.

2 Temperature Sensor

The Contractor shall provide minimum 6 (six) temperature sensors (1 (one) for ambient temperature measurement with shielding case and 5 (five) for module temperature measurement). The temperature sensor shall be Resistance Temperature Detector (RTD)/ Semiconductor type with measurement range of 0°C to 80°C. The instrument shall have valid calibration certificate.

3 Anemometer

The Contractor shall provide minimum one no. ultrasonic wind sensor (no moving parts) for wind speed and direction monitoring.

Parameter	**Specification**
Velocity range with accuracy limit	0 – 60 m/s with +/-2% accuracy @12 m/s; Resolution: 0.01 m/s
Wind direction range with accuracy limit	0 to 360° (No dead band) with +/-2° accuracy @12 m/s; Resolution: 1°
Mounting Bracket	Anodized Aluminium bracket to reduce corrosion, all mounting bolts of SS
Protection Class	IP 66
Output	RS 232 and RS 485

4 Data logger and Data Acquisition System

Data logger for the weather monitoring station should have the following features:

Provision for analog, digital and counter type inputs for interfacing with various type of sensors

i) Analog Input

ii) Adequate nos. for all analog sensors with redundancy

iii) Provision for operation in different current and voltage ranges as per connected sensors Accuracy of +/-0.1% of FS (ii) Digital Input

iv) Adequate no. of Digital inputs and outputs for the application

v) Connectivity and Data transmission:

Built-in GSM/ GPRS modem for wireless data transmission to SCADA/cloud server (procurement of GPRS enabled SIM Card and connection subscription to be the responsibility of Contractor). It should be possible to remotely communicate with the device for configuration settings.

RS485 MODBUS interface for data collection and storage on SCADA

Web interface with provision for user login to enable viewing and downloading of weather data in XLS/ CSV format

Communication protocol should support fast data transmission rates, enable operation in different Frequency bands and have an encryption-based data security layer for secure data transmission

vi) Display Settings: Graphic LCD screen which should be easily accessible and should display relevant details like all sensor values, battery strength, network strength etc.

vii) Provision of Time synchronization from telecom time or server time

viii) Data Storage: Provision for at least 2 MB internal Flash Memory and at least 8 GB Micro SD card (expandable) (ix) Protection level: IP65

10.20 **CCTV Camera**

CCTV Cameras along with monitoring stations (sufficient numbers) and all other accessories required for its proper operation must be installed to have complete coverage of following areas for 24 hours.

i. Main entry: Covering all the entry/exit

ii. Along the Plant Perimeter: Covering complete perimeter of Plant Area to capture all possible intrusion

iii. Control Rooms: Covering Entry/Exit and Equipment Rooms

iv. Switchyard

Monitoring stations of the CCTV Network shall be installed in Main Control Room.

The CCTV system shall be designed as a standalone IP based network architecture.

System shall use video signals from different cameras at defined locations, process the video signals for viewing on monitors at control room and simultaneously record all video streams using latest compression techniques.

Camera shall be colour, suitable for day and night surveillance (even under complete darkness) and network compatible.

It shall be possible to control all cameras i.e., PTZ auto / manual focus, selection of pre-sets, video tour selection etc. The software shall support flexible 1/2/4 windows split screen display mode or scroll mode on the display monitor for live video.

The system shall support video analytics in respect of the following:

(i) Video motion detection

(ii) Object tracking

(iii) Object classification

(iv) Camera server shall be provided with sufficient storage space to storage recordings of all cameras at HD mode for a period of 15 days. All recordings shall have camera ID, location, date and time of recording.

10.21 **Fire Alarm System**

Standards and Codes

Standard / Code	Description
IS 2189	Selection, Installation and Maintenance of Automatic Fire Detection and Alarm System Code of Practice
IS 2171	Portable Fire Extinguishers, Dry Powder (Cartridge Type)
IS 8149	Functional requirements for twin CO_2 fire extinguishers (trolley mounted)
IS 2546	Galvanized mild steel fire bucket
National Building code 2005	

The Contractor shall ensure the compliance of fire detection and alarm system as per relevant standards and regulations. The installation shall meet all applicable statutory requirements and safety regulations of state/central fire department/body or any other competent authority in terms of fire protection.

Firefighting system for the proposed power plant for fire protection shall be consisting of but not limited to:

(i) Sand buckets

(ii) Portable fire extinguishers (CO_2 and dry powder type)

(iii) Microprocessor based fire alarm panel

(iv) Multi sensor smoke detectors

(v) Hooter cum strobe

Minimum two numbers of fire extinguishers (CO_2 and Foam type each, of capacity 10 kg having BIS certification marking as per IS: 2171) shall be provided at every building / enclosure, transformer yard and switchyard. However, contractor must comply with existing building code for fire protection and relevant IS codes.

Four numbers of stand with four sand buckets on each stand shall be provided in the Transformer Yard. Sand buckets inside the building shall be provided at strategic locations as decided during detailed engineering.

Digital output from the fire detection system shall be integrated with SCADA

Contractor shall submit the plan for fire and smoke detection system for the Employer's approval.

10.22 **Testing Instruments**

The Contractor shall provide the following set of instruments for on-site testing.

a. Earth resistance tester

Parameter	Specification
Display	Backlit LCD or LED display
Range	Earth Resistance: up to 2000 Ω Earth Voltage: 200 V
Accuracy	± (2% + 5)
Safety Ratings	IP 56
Programmable Limits setting	Enabled
Accessories	
Earth Ground Stakes (4 Nos.)	
Three cable reels with cable length up to 20 m	
Carry Case-1 (capable of handling tester along with accessories)	
1 set of spare battery	

b. Array tester

Parameter	Specification
Display	Backlit LCD or LED display
Functionality	All electrical tests required by IEC 62446-1:2016
Memory	Up to 200 records & USB downloadable to Computer
Accessories	
A set of two, 4mm fused leads for extra protection during installation tests	
Leads which enable the array tester to connect directly to PV arrays	

1 set of spare battery

c. Insulation tester

Parameter	Specification
Display	Backlit LCD or LED display
Insulation Test Range	0.1 MΩ to 10 GΩ
Test Voltage	250V, 500V, 1000V, 5000V
Test Voltage accuracy	+20% on positive side only no negative variation is allowed
Insulation Test Current	1 mA nominal
Auto Discharge	Discharge time< 0.5 Second for C = 1
Open Circuit test Voltage	>4 V, <8 V
Accessories	
Heavy duty Test Lead Set – 4 Nos.	
Carry Case with sufficient space for accommodating accessories.	

d. Digital Multimeter

Parameter	Specification
Display	Backlit LCD or LED display; Minimum resolution: 5 ¾ places for DC, 4 ¾ places for AC
Measuring Category	1000V CAT III as per IEC Standard 61010-1; wave shape independent RMS measurement (True RMS) suitable for operation in the site conditions.
Additional Functions	Resistance (Ω), Temperature (oC), Continuity, Diode, Capacitance, Frequency, Duty cycle measurement
Accessories	
Temperature Probe	
Silicon Test Lead	
Alligator Clip	
Carry Case with sufficient space for accommodating accessories.	

e. Clamp meter

Parameter	Specification
Display	Backlit LCD or LED display
Measuring Category	1000V CAT III as per IEC Standard 61010-1; wave shape independent RMS measurement (True RMS) suitable for operation in the site conditions.
Current Range	AC&DC Current up to 1000A/400 A
Voltage range	AC&DC Voltage upto 1000V

Additional Functions	Resistance, continuity, diode and non- contact voltage detection, Active, Reactive and Apparent Power, THD, PF
Accessories	
Test leads	
Electrical test leads	
Probe light & extender	
Carry Case with sufficient space for accommodating accessories.	

f. Infra-red thermal imaging camera

Parameter	Specification
Spectral response	8 µm to 14 µm (LW)
Temperature-sensitivity and calibration range	-20 °C to +120 °C
Atmospheric air temperature	-10 °C to +40 °C
Thermal sensitivity	NETD ≤ 0.1 K at 30 °C
Geometric resolution	640 x 480 pixels
Photo camera resolution	Approx. 30 times of IR camera resolution
Absolute error of measurement	< ± 2 K
Adjustable parameters	Emissivity, ambient temperature
Adjustable functions	Focus, temperature level and span
Measurement functions	Measuring spot, measuring area with average and maximum temperature
Calibration	The measuring system (Camera, lens, aperture and filter): The camera has to be traceably calibrated at least every two years. The calibration has to be documented. If the camera is not compliant, it has to be readjusted by the manufacturer.
Documentation	Storing of the infrared picture with the radiometric data

g. Digital lux meter

Parameter	Specification
Range	0 – 1000 lux
Accuracy	± (2% + 5)
Resolution	1 lux
Display	3½ digits, Backlit LCD/LED

All testing equipment shall possess valid calibration certificate issued from approved NABL labs.

Instruments of superior rating is allowed after seeking consent of the Employer.

Maintenance, calibration, up keeping, repair & replacement of these tools will be in the scope of the Contractor during O&M.

It is Contractor's responsibility to arrange for tools, tackles, logistics, test kits, manpower, experts etc. required for trouble free operation of Plant.

10.23 DC DISTRIBUTION BOARD (DCDB)

DC distribution board shall be provided in between solar array and Inverter. It shall have MCCB of suitable rating for connection and disconnection of array section. It shall have meters for measuring the array voltage and array current. DCDB can also be integrated into INVERTER for space saving.

10.24 CABLES ACCESSORIES

- Only terminal cable joints shall be accepted. No cable joints to join two cable ends shall be accepted.
- Cables inside the control room shall be laid in suitable Cable Trays of approved type.
- Cable terminations shall be made with suitable cable lugs & sockets etc. crimped properly and passed through brass compression type cable glands at the entry and exit point of the cubicles. The panels' bottoms should be properly sealed to prevent entry of snakes/lizard etc. inside the panel.
- The terminal end of cables and wires are to be fitted with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.

10.25 METERING ARRANGEMENT:

The bidder shall install metering arrangement in accordance with the prudent practice and complying with the requirement of GERC/ GETCO. Indicative specification is given hereunder:

	Features	Requirement
	Type:	ABT
	Supply System	3 phase, 4 wire
	Voltage:	110 V
	Class of accuracy:	0.2 S
	CT secondary Current	5 Amp
	Features	With TOD features, completely wire with TTB, as per GETCO/ SLDC Specification and mounted in the panel.

	Import and Export Energy meter system complete panel
A	1no. complete panel comprising 2 nos. (MAIN + CHECK) Import-Export Energy ABT type meter with TTB's. Panel will be as per APDC specification. Meter will be supplied with complete testing and calibration from accredited agency.
C	- Above Package also includes user manual, universal battery charger, RS 432 communication cable, rubber boot, carrying case.
D	Software for meter for downloading of data 1 no. and also remote monitoring and acquisition of data.

10.26 **ERECTION, TESTING & COMMISSIONING**

A. The installation shall be carried out by an electrical contractor holding a valid license as required by the State Government Authorities.

B. The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection. It shall be the sole responsibility of the contractor in obtaining safety certificate / approval from local statutory authorities.

C. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost to the Oil India Ltd

D. In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the Oil India Ltd, the successful Bidder shall unload, assemble, erect, install test, commission and hand over all electrical equipment included in this contract.

E. Erection materials 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 Oil India Ltd back to Oil India Ltd.'s stores shall also be included under this scope of work.

G. All equipment and instruments, indoor and outdoor, shall be marked with Numbers and provided with suitable danger boards as per Indian Electricity Rules/code etc. before commissioning.

H. The contractor shall touch up the surface with paint of same shade for equipment, which are scratched and / or damaged during transportation and erection before commissioning.

I. The contractor shall employ skilled and semi-skilled labours for erection, testing and commissioning as required. All the electricians, cable jointers, wiremen, welders and others employed shall possess valid certificates / license recognized by competent authorities.

J. The contractor shall set up his own facilities at site at allocated place to undertake fabrication/assembly jobs etc.

K. The Contractor shall carry out major civil engineering works as called for in scope of work pertaining to electrical equipment's like foundation for modules structures control room rooms for O & M staff etc. as per the latest relevant drawings. For this they may carry out minor civil works such as foundation bolts, cutting holes in walls, chipping of floor and ceiling etc. making good the same after installation of the equipment and any other minor civil works advised by Oil India Ltd for completion of the work has to be carried out without any extra charges.

L. During erection, care is to be taken to see that painting does not peel off at any place and if so, it has to be given a 'Touch-up' after erection by the contract.

10.27 **SPECIFICATION FOR TESTING & COMMISSIONING**

The testing 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 stipulations made in relevant general specifications.

b) The testing of all electrical equipment 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 that all materials, workmanship and installations conform to the accepted design, engineering and construction standards, as well as accepted code of practices and stipulations made in the relevant general specifications.

c) The contractor in the presence of representative / Consultant of Oil India Ltd shall carry out all tests 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.

10.28 **PREPARATION OF THE EQUIPMENT 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 suppliers 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:

- Physical inspection Modules for removal of any foreign bodies, external defects, such as damaged, loose connection in Junction Boxes & Inverter etc. loose foundation bolts etc.
- Check for the free movement of mechanism for the circuit – breaker, rotating parts of the rotating machines and devices.

- Check for tightness of all cable joints and bus bar termination ends as well as earth connections in the main earthing network.
- Check for clearance of live bus bars and connectors from the metal enclosure.
- Check for proper alignment of all the modules etc.
- Continuity checks in case of power and control cables.
- Checking of all mechanical and electrical interlocks including tripping of breakers using manual operation of relay.
- Checking of alarm and annunciation circuits by manual actuation of relevant relays.
- Check and calibrate devices requiring field adjustment/calibration like adjustment of relay setting etc.
- Check for proper connection to earth network of all non-current carrying parts of the equipment and installation.

c) The relevant tests shall be 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:

i) Check for completeness of installation.

ii) Each pole to earth insulation resistance test.

d) Cables

i) Insulation resistance test shall be conducted by Magger for cables rated up to 1.1kV grade.

ii) All 1.1 kV cables shall be subjected to high voltage test after joining and terminating but before commissioning as per relevant standards.

iii) In each test, the metallic sheath / screen / armour should be connected to earth.

iv) Continuity of all the cores, correctness of all connections as per wiring diagram, correctness of polarity and phasing of power cables and proper earth connection of cable glands, cable boxes, armour and metallic sheath, shall be checked.

e) Earthing

i) Tests to ensure continuity of all earth connections.

ii) Tests to obtain earth resistance of the complete network by using earth tester. The test values obtained shall be within the limits.

(B) CIVIL, MECHANICAL AND PLUMBING WORKS

10.29 **General Requirement**

1) This section of Technical Specifications describes detailed technical and functional requirements of all civil, structural, mechanical & plumbing works included in the scope.

2) Standards & Codes

a. All design and construction of civil works shall conform to relevant Indian standards such as BIS, IRC, MORTH, NBC etc.

b. Design of steel structures shall conform to IS: 800, 801 or 802 as applicable. Design of concrete structures shall conform to IS: 456. For design of liquid retaining structure IS: 3370 shall be followed. Only in case of non-availability of Indian standard, equivalent American or British standard may be used for design with prior approval of the Engineer and the contractor shall submit proper justification for the same along with his request to the Engineer for review and approval, and the decision of the Engineer shall be final and binding.

c. All the design/ drawings shall be prepared/ approved either by in-house Engineering Team of the contractor (or by his Engineering Consultant) with qualified engineering staff with relevant experience in successful design of solar SPV plants.

d. The design calculations for MMS, RCC structure, Steel structure, Foundation system, Road work, Drainage work, etc. shall be submitted for prior approval of Engineer before commencement of construction.

e. As per project requirements, the Employer may ask for approval of all civil designs and drawings by a Chartered Civil/ Structural Engineer.

f. The design calculations shall be supplemented with a neat sketch showing the structure geometry, node and member nos., lengths of various typical members, support points and type of supports, types of materials & type of sections with properties considered in analysis & design. The report shall also include back-up calculations for various loads adopted in design, brief write-up on primary load cases and design load combinations considered and conclusions on design results (with supporting sketches) for easy reference and clarity. Where a computer program (other than STAAD) is used for analysis and design, the contractor shall include a write-up on the computer program used along with examples for validation check. Design Input (format suitable to the programme used and also in STAAD format) and output file shall also be given in the design report and in soft copy to facilitate its review and approval by the Engineer.

g. The methodology for construction of MMS and its foundations, Road & drainage works and Procedure for pile load test shall also be submitted for prior approval of Engineer before start of these works.

10.29.1 **Topographical Survey**

1) The contractor shall be responsible for detailed Topographical Survey of the proposed project site. The work shall be carried out through an agency with relevant experience and qualified survey team.

2) The Topographical survey shall be conducted at 20m x 20m grid, or as directed by the Engineer, with the help of digital surveying instruments like Total Station.

3) The Contractor shall carry the Bench Mark from nearest GTS Bench mark or any other established source like Railway station, Permanent PWD/ WRD structure etc. as approved by the Engineer, by fly-levelling and establish two permanent bench marks (PBM) at site. All subsequent transfer of levels shall be carried out with respect to these PBMs. The work shall also include constructing permanent reference pillars (RP) at suitable locations as directed by the Engineer. These reference pillars shall be labelled permanently with

their respective coordinates and reduced levels for future use. The Permanent Bench Marks (PBM) and reference pillars (RP) shall be shown on the survey drawings.

4) While carrying bench mark to the project site, levels shall also be established on the permanent objects like culverts etc. at least on one object in every 1 (one) km if available along with route with adequate description about the objects. These levels shall be maintained at site & also mentioned in the survey report to facilitate locating these objects later on.

5) The survey work shall be carried out in UTM grid system. The contractor shall also establish the latitudes and longitudes of all the corners of the project site. At least 50m width of the adjoining plots and surrounding areas shall also be covered in the survey for correlation with adjoining plots and facilities. The grids for the survey work shall be established in N-S & E-W direction (corresponding to Geographical North or Plant North) as directed by the Engineer.

6) Positions, both in plan and elevation, of all natural and artificial features in the area like waterways, railway tracks, trees, cultivation, houses, fences, pucca and kutcha roads including culverts and crossings, foot tracks, other permanent objects like telephone posts and transmission towers etc. are to be established and subsequently shown on survey maps by means of conventional symbols (preferably symbols of survey of India Maps). All hills and valleys within the area/areas are to be surveyed and plotted on maps by contours. Any unusual condition or formation on the ground, locations of rock outcrops (if visible on the surface) and springs/falls, sand heap/dune, possible aggregate deposits etc. shall also be noted and plotted on contour maps.

7) The record of measurement of all Reduced Levels (RL) shall be submitted in digital format, (in x, y z coordinate system) along with preliminary contour plan of the site, for Engineer's review before submission of final contour map. The contour interval shall be as required for proper representation of the topography however it shall not be more than 0.5m. The Contractor shall submit survey maps of the site in 1:10,000 scale indicating grid lines and contour lines, demarcating all permanent features like roads, railways, waterways, buildings, power lines, natural streams, trees, sand dunes etc. Present use of the site i.e. mining, quarrying, agriculture etc., existing drainage pattern of the site, possibility of water logging and high flood level of the area shall also be captured in the document. The project plot boundary with coordinates of all corner points along with coordinate grid of 50m x 50m interval shall be marked on the contour map.

10.29.2 **Geotechnical Investigations**

1) The contractor shall be responsible for detailed Geotechnical investigations at the proposed project site for the purpose of foundation design for various buildings, structures, HT lines, MMS etc. and other design/ planning requirements. The investigation work shall be carried out through any Govt. approved/ NABL accredited agency. The contractor shall submit the credentials of the proposed agency along with relevant certificates in support thereof for verification/ approval of the Investigation Agency by the Engineer.

2) The scope of work includes execution of complete soil exploration including boring and drilling, standard penetration test (SPT), collecting disturbed (DS) and undisturbed samples (UDS), collecting ground water samples, trial pits, electrical resistivity tests (ERT), field & laboratory CBR tests, conducting laboratory tests on collected samples of soil & ground water and preparation and submission of report. SPT shall be carried out in all types of soil deposits and in all rock formations with core recovery up to 20% met within a borehole. SPT test shall be conducted at every 1.5m interval or at change of strata. The starting depth of SPT shall be 0.5m from ground level. UDS shall be collected at every 1.5m interval or at change of strata.

3) The field investigations shall mainly include drilling of min. 5m deep boreholes (50% of total No. of boreholes shall be 10m deep), conducting SPT and collecting Disturbed (DS) and Undisturbed samples (UDS), conducting in-situ CBR test for approach road to the plant, internal roads & peripheral road; Trial pits if specified (min 2mx2mx2.5m deep) and ERT s. Number and location of bore holes, CBR tests and Trial pits shall be decided as per the project layout, site topography and soil conditions in consultation with the Employer. There shall be minimum 1 nos. of Borehole per 5 acres of the area (However, total number of boreholes shall not be less than 5), 3 nos. of Trial pits, 5 nos. of CBR test & ERT, 5 nos. of Ground water samples for laboratory investigations. The soil/ rock samples for laboratory investigations shall be collected from each borehole and trial pit in sufficient nos. (Note- In case the project plot is divided in to number of discrete blocks separated from each other, min. 3 nos. of bore holes, 2 trial pits, 3 ERT and 3 CBR tests shall be taken per such block).

4) The proposed Geotechnical investigation plan indicating proposed locations of Trial pits, Boreholes, CBR test & ERT shall be submitted to the Employer for review and approval before start of work.

5) Laboratory tests shall be conducted on DS & UDS samples and ground water samples in sufficient no. & shall include, Soil classification, Grain size analysis including Hydrometer analysis, determination of Bulk and dry density, Specific gravity, Natural moisture content, Atterberg limits, Tri-axial shear tests (UU), Undrained shear test, Consolidation tests, Unconfined compression tests, Free swell index, chemical analysis of soil and water samples to determine the carbonates, sulphates, chlorides, nitrates, pH, Organic matter and any other chemicals harmful to concrete and reinforcement/ steel. Laboratory tests on rock samples shall be carried out for Hardness, Specific Gravity, Unit Weight, Uniaxial Compressive Strength (in-situ & saturated), Slake Durability etc. Laboratory CBR test on soaked samples shall also be conducted on min. 5 no. of soil samples to ascertain the suitability of soil for sub-grade and requirement of any treatment of subgrade soil in case of CBR <2% as per IRC requirements.

6) After completion of field and laboratory work, the contractor shall submit a Geotechnical Investigation Report for Engineer's approval. All bore log details and lab test results shall be presented in the report as per provisions of relevant BIS standards indicating BH coordinates, Existing GL, Depth of water table, Method of drilling etc. The report shall include a Map showing the locations of various field tests including coordinates, calculations and recommendations for foundation type and safe bearing capacity (SBC) for various Plant buildings (LCR, MCR etc.) and Open installations, Switch Yard

structures & Sub-Station (as applicable), Transformer foundation, HT lines (as applicable), MMS foundation etc. corresponding to settlement of 25mm & 40mm.

7) The report shall include the study for “Liquefaction potential assessment of the ground and suggestions for any ground improvement measures” as required.

8) The report shall also include ground water analysis (water sample collected from bore well) to ascertain its suitability for construction purposes, recommendations for type of cement, grade of concrete & minimum cement content as per prevalent soil characteristics with respect to presence of aggressive chemicals and environment exposure conditions as per relevant BIS specifications. However, minimum grade of concrete shall be M25 (M30 in coastal areas/ marshy soil) for all RCC works except liquid retaining structures like underground water tank etc. where minimum grade of concrete shall be M30 (M35 in coastal areas/ marshy soil). Cement higher than 43 Grade, shall not be used in construction.

9) In case the contractor wishes to adopt concrete pile foundation for MMS supports the Geo-tech. report shall also include the calculations for safe pile capacity under direct compression, lateral load and pull out. The report shall include recommendations about type of pile, its depth and dia. to be used.

10) In coastal areas and in marshy or swelling type soil, under reamed or driven precast concrete pile shall be used. In case contractor wishes to use helical piles the design, fabrication and installation shall conform to IBC (International building code).

11) The contractor shall carry out field trials for initial load test on pile to verify the pile design to confirm the safe load carrying capacity under direct compression, Lateral load and Pull out.

12) The nos. of piles to be tested under each category shall be finalized corresponding to geotechnical characteristics at site, plot area etc. However, minimum 5 nos. of piles shall be tested (min. 3 nos. in each block if the plant site is divided in discrete blocks separated from each other) under each category of load.

13) The locations of test piles shall be distributed over the plant site and to be finalized in consultation with Engineer. In case the MMS column is fixed using base plate-anchor bolt assembly, the adequacy of provided pile reinforcement in job (working) pile corresponding to the set of test loads shall be reviewed by the contractor for any additional requirement of reinforcement and the same shall be provided in the pile to be cast for initial load test.

14) In case the Contractor proposes to embed the Column leg in the pile for fixing, the test pile shall be provided with embedded column leg as per approved design and any dowels as required for application of test load. The drawing for the Test pile shall be submitted to Engineer for his approval before casting the test pile. The load test on pile shall be conducted after min. of 28 days from the date of casting. In case the contractor desires to conduct the test earlier than 28 days, he may use suitable higher-grade concrete or if there is substantial evidence from earlier cube test results on design grade concrete to

demonstrate the early gain of required compressive strength prior to application of the test load.

15) However, under no circumstances the test shall be conducted before 15 days of the date of casting the pile. All the dial gauges and hydraulic jack assembly shall be properly calibrated as per the requirements of relevant BIS standards and valid calibration certificate to this effect from Govt. / NABL accredited Test agency shall be submitted to the Engineer before use.

16) The contractor shall submit detailed methodology for conducting the tests in line with IS: 2911 (Part 4) for Engineer's approval before commencement of any test. After completion of these tests the contractor shall compile the test results and submit the report in a proper format as specified in the BIS standard with recommendations/ conclusions for Engineer's approval. The pile work shall start only after approval of the final pile design duly verified/ confirmed with initial load test results.

17) All buildings / Open installations (MCR, LCR etc.), Switchyard and Sub-station area shall have levelled ground. No foundation for MMS, Buildings, Switch yard equipment & structures, Sub-stations, HT Line Towers, Transformer etc. shall rest on filled up ground. However, minor structures like cable trench, cable rack, pipe pedestal etc. may rest in filled up soil with max. safe bearing capacity for design consideration not more than 3 T/m^2

10.29.3 **Other Investigations**

a) The contractor shall also obtain and study other input data at proposed project site for design of the project from metrological department/ local govt. authorities. This shall include data related to Rainfall, Maximum & Minimum ambient Temperature, Humidity, HFL etc.

b) The contractor shall carry out Shadow Analysis at proposed site and accordingly design strings and array layout with optimum use of space0, material and man power. In case of large variations in topography (3° to the horizontal) the study shall also include the effect of topographical variations on array layout and MMS structure design adequacy and stability. The contractor shall submit all the details/ design to the Engineer for review/ approval.

c) The contractor shall also identify potential quarry areas for coarse and fine aggregates to be used for concrete and shall carry out the concrete mix design for different grades of concrete to be used before start of work. The concrete mix shall be designed for each source of cement and aggregates as per provisions of relevant BIS Standard. The concrete mix design shall be carried out through NABL accredited Laboratory or any Govt. agency approved by the Engineer. In case the contractor proposes to use RMC, he shall submit the Concrete mix design report from the RMC supplier for review and approval by the Engineer. (In case of RMC, reports for periodic cube tests from the supply batch shall also be submitted for review and record).

10.29.4 **Area Grading and Land Development**

a. The Finished Grade Level (FGL) of the proposed plant shall be fixed with reference to the highest flood level (HFL) and surrounding ground profile at

proposed site to avoid flooding of plant site. The data regarding HFL at proposed site shall be obtained from the metrological department by the contractor. In case of absence of this data, the contractor shall assess the required information through local site reconnaissance. The area at and around all buildings/ open installations (LCR, MCR etc.), transformer yard and switch-yard shall be uniformly levelled at suitable RL to be finalized considering topography and HFL at site. The minimum plinth level of all buildings/ open installations shall be 450mm above FGL. Module mounting structure foundation/ Pile cap or any other pedestal shall be min. 200mm above FGL.

b. A detailed drawing for site levelling and grading (if necessary) shall be submitted by the contractor before commencement of grading and area development works. The estimated volume of cutting and filling shall also be marked on the Grading drawings for reference. The final grade levels to be adopted for different blocks shall be clearly marked on the Plant Layout/ Module Layout drawing.

c. The contractor is responsible for making the site ready and easily approachable by clearing bushes, felling of trees (mandatory permissions/ licenses/ statutory clearances from competent authorities if required for cutting of trees, blasting or mining operations, disposal of waste material etc. shall be obtained by the contractor), cutting, filling with selected excavated earth or borrowed earth including identifying borrow areas. Except in exceptional cases (with approval of the Engineer), filling shall be made up of cohesive non-swelling material. The filling for levelling/ reclaiming the ground/ area shall be done in layers not more than 150mm of compacted thickness in case of cohesive (clayey) soils and 250mm compacted thickness in case of granular (sandy) soils with compaction up to 95% (of modified proctor density) and 80% (of relative density) respectively. The slope at edge of graded areas shall not be steeper than 1:1.5 (1 Vertical: 1.5 Horizontal) in cutting and 1:2 (1 Vertical: 2 Horizontal) in filling. In case of filling with rock material, the edges shall be provided in line with provisions of relevant BIS standard.

d. It shall be ensured that the land is graded or levelled properly for free flow of surface run-off and the grade levels shall be fixed with respect to high flood level at site, drainage pattern and system requirements. It shall be ensured that the land is used optimally to have maximum solar power generation considering full utilization of the plot areas. It is advisable to follow the natural flow of water at the ground as far as possible for drainage design.

e. In case the filled up earth is brought from outside the plant or borrow areas (when the material inside plant area is not found suitable for grading work or if directed by the Engineer), the contractor shall carry out all required soil investigations to ascertain the suitability of the borrowed soil for land development and filling purposes. Contractor's scope shall also include arranging land lease, getting all necessary statutory approvals for mining, payment of necessary challan etc. Excess earth, if any, shall be disposed of properly at location as directed by the Engineer.

10.29.5 **Roads**

a. Suitable approach road (as applicable) from nearest public road up to Main gate(s), Access road from Main gate(s) to Main Control Room (MCR)/Local

Control Room (LCR), Internal roads connecting MCR/LCR and other facilities/ buildings/ open installations like Inverter control room(s) (ICR), Sub-station & Switch yard (as applicable) etc. and Internal peripheral road along the boundary fence/ wall shall be provided for safe and easy transportation of men, material and equipment during construction and maintenance.

b. The Approach road connecting nearest public road and the Main gate shall be of 5m wide carriage way with 0.5m wide shoulders on either side. The access road connecting Main gate and MCR and internal access road(s) connecting MCR/LCR to various facilities/ buildings shall be of 3.5m wide carriage way with 0.5m wide shoulders on either side while the peripheral road shall be of 2.5m wide carriage way with 0.5m shoulders on either side. The top of road (TOR) elevation shall be minimum 200 mm above FGL to avoid flooding of roads during rains. The roads shall be provided with alongside drains as per design requirements of drainage system to avoid flow of storm water over the road. The roads shall be designed and constructed as per IRC SP-20 corresponding to design vehicular traffic (150 commercial vehicles per day for approach and internal access roads & 45 commercial vehicles per day for peripheral road) and critical field CBR value of the subgrade. Shoulder shall be of min. 150mm thickness.

c. However, following minimum road section details shall be followed:

d. Approach road from nearest existing Public road to Main Gate, Access road from Main Gate to MCR/LCR and Internal roads connecting MCR/LCR with other facilities / buildings:

(i) Topping: wearing course of 20 mm thick pre-mix carpet or surface dressing, compacted 75mm thick, with murrum blended with WBM Grade-III, as applicable.

(ii) WBM (CBR>100%): compacted 75mm thick, Grade III (iii) WBM (CBR>100%): compacted 100 mm thick, Grade II

(iii) Granular sub-base (CBR>15%): compacted 200 mm thick in two layers of 100mm thickness each,

(iv) Compacted subgrade: top 300mm thick, compacted up to 98% of standard proctor density

(v) Shoulders: compacted 150mm thick, murrum blended with WBM Grade-III Peripheral Road:-

a) Topping: surface dressing, compacted 75 mm thick, murrum blended with WBM Grade -III

b) WBM (CBR>100%): compacted 75 mm thick, Grade III (iii) WBM (CBR>100%): compacted 75 mm thick, Grade II

c) Granular sub-base (CBR>15%): compacted 150 mm thick in two layers of 75mm thickness each,

d) Compacted subgrade: top 300mm thick, compacted up to 98% of standard proctor density

e) Shoulders: compacted 150mm thick, murrum blended with WBM Grade-III

e. Soaked CBR value of sub-grade shall not be less than 2%. Where the CBR of the subgrade is less than 2 % a capping layer of 100 mm thickness of material with a minimum CBR of 10 % is to be provided in addition to the sub-base required for CBR of 2 %. When the subgrade is silty or clayey soil and the annual rainfall of the area is more than 1000 mm, a drainage layer of 100 mm over the entire formation width should be provided conforming to the gradation given in Chapter 6 of IRC SP-20. This layer will form a part of the designed thickness of sub-base.

f. In case of no-availability of murrum in the nearby areas of the project site, suitable other screening/ blending material for WBM construction may be used conforming to provisions of IRC SP 20.

g. The construction of road shall conform to relevant IRC/ MORTH standards.

h. Drain, cable or any other crossing shall be provided with RCC box or precast concrete pipe culvert. The culvert design shall conform to relevant IRC standard. Except for module cleaning system the pipes for road culverts shall be of minimum class NP3 conforming to IS 458 with min. soil cover of 750mm above the pipe. In case of soil cushion less than 750mm suitable concrete (M20) bedding/ encasement shall be provided. Water supply pipe for module cleaning and service/ drinking water crossing the road shall be laid through Medium class GI steel pipe conforming to IS: 1161.

i. Minimum dia. of casing pipe to be used at road/ drain crossing for laying any facility like electric cable, water pipe line etc. shall be 150mm.

j. Maintenance pathways of min. 1.0m width shall be provided between SPV arrays for easy movement of maintenance staff, tools, equipment and machinery, washing of modules etc. The pathway area shall be generally levelled and well compacted manually/ mechanically. Areas of depression, valley zones or wherever there is noticeable change in topography, the same shall be levelled by laying & compacting murrum or any other suitable granular material so as to match the top finished surface with ground topography/ grade to avoid accumulation of water in the region and allowing its free flow to keep the area devoid of mud/ sludge.

k. The design and drawings for approach road, all internal roads and culverts shall be submitted to the Engineer for approval before execution.

10.29.6 **Surface / Area drainage**

a. The contractor shall design and construct storm water drainage network for smooth disposal of storm water from the plant to the nearest available drainage outlet.

b. The storm water drainage system shall be designed and planned to ensure no water stagnation in the plant.

c. The design shall conform to the provisions of IRC SP 42 and best Industry practices. (The design rainfall shall be taken as max. hourly rainfall at 25 years

return period at project site as provided in the Isopluvial map of the relevant subzone annexed with Flood Estimation Reports of Central Water Commission (CWC).

d. The coefficient of run-off for estimation of design discharge shall be considered as per catchment characteristics, however it shall not be less than 0.6.

e. The drainage scheme shall be designed considering the plant plot area and the surrounding catchment area contributing to the plant area drainage as per the topography.

f. The storm water drainage system shall be a network of open surface drains (with rectangular or trapezoidal cross section) and shall generally be designed to follow the natural flow of water and ground contours.

g. Suitable size plant peripheral drain as per design (min. bottom width x depth: 500mm x 500mm) along inside of plant boundary wall/ fence shall be provided for smooth channelization of outside storm water and to avoid flooding in the plant. The size of all internal and road side drains shall not be less than 450mm (bottom width) x 500mm (depth).

h. All trapezoidal drains shall be lined with either brick or RR masonry/ concrete or stone slabs as suitable to the site conditions. The min. Thickness of the lining shall be 115mm for brick masonry, 75mm for concrete slabs, 150mm for RR masonry and 100mm for stone slabs. The lining shall be in CM (1:4) and the joints shall be raked and pointed with CM (1:3), however, the joints in lining of plant peripheral drain may be left without pointing.

i. In case of rectangular drain, the thickness of the wall shall be checked against structural stability. Min. thickness shall be 230mm for brick wall, 300mm for RR masonry and 125mm for RCC work, except for garland drain around buildings where the min. wall thickness can be 115mm, 200mm and 100mm respectively for brick masonry, RR masonry and RCC work.

j. The structural design of drains shall be as per provisions of relevant BIS standards and good industry practice.

k. The drain outfall shall be connected to the nearest existing natural drain(s)/ water body outside plant premises and it shall be ensured that the drainage water shall not re-enter the plant nor encroach/ flood in the adjacent property/ plot.

l. The proposed drainage scheme along with design calculations and drawings shall be submitted to the Engineer for review/ approval before start of construction.

m. The contractor shall also explore the possibility of providing rain water harvesting system for water conservation by constructing suitable collection wells along the drains or through provision of detention ponds etc. The scheme for rain water harvesting along with design calculations shall be submitted for approval.

10.29.7 **Peripheral boundary Wall/Fence**

a. The plant peripheral boundary shall be provided with either Chain link or barbed wire fencing or masonry boundary wall as specified.

b. The boundary fence/ wall shall be provided along the Solar PV plant boundary to demarcate the plant boundary and to keep away the unauthorised access to the plant. The fence/ wall shall be provided with Main entry gate. The fencing/ wall shall be with 2.5m height above grade level including 400mm dia. GI concertina wire along with 3 no. of barbed wires on either arm to be fixed on Y shape angle brackets. The main gate shall be min. 5.5m wide (clear) (4 m carriage way + 1.5m wicket gate).

c. Chain link fencing

i. The fencing shall be of Chain link (GI or poly coat GI as applicable) mesh fabric with internal, corner and stay posts of RCC (min 200mm x 200mm size, M30 grade) or GI angle (min. ISA 75x75x6 mm), as applicable, along with 150mm height 230 thick brick/ 300 thick RR masonry toe wall, with 100mm thick PCC (1:3:6) foundation.

ii. The brick masonry toe wall shall be plastered with 15 thick CM (1:4) plaster on both faces and shall have min. 50 thick PCC (1:2:4) coping finished smooth and projecting 25mm on either side of the wall with top sloping inwards. The depth (below NGL) and width of toe wall foundation shall not be less than 450mm and 500mm respectively.

iii. Spacing of intermediate posts shall not be more than 2.5m. Every 10^{th} intermediate post shall be provided with a stay post while every corner post shall be provided with two stay posts on either side.

iv. Joints in RR masonry shall be properly raked and pointed with CM (1:3).

v. At pond or drain area suitable grid of MS solid SQ bar of min. Size 25 mm x 25 mm (spacing of vertical bars not more than 125mm) shall be provided in place of toe wall for smooth flow of water.

vi. The GI chain link mesh fabric (40x40 mm with min. wire gauge 3.15mm, both ends twisted) and fencing shall conform to IS: 2721. Poly coat GI chain link mesh (50x50mm) shall conform to ASTM 668 and fencing shall conform to ASTM 567.

vii. Each fence panel, in lieu of tie wire, shall be provided with 35x35x3mm GI edge angle at top and bottom with mesh fabric firmly secured to them and to intermediate support angles.

viii. All MS sections shall be painted with 2 coats of epoxy paint of approved make and shade over 2 coats of suitable primer.

d. Boundary wall

The boundary wall structure shall be an RCC beam-column structure with wall of either brick (min. 230mm thick), RR masonry (min. 300mm thick) concrete block (min. 200mm thick) or of Pre-cast RCC wall panels (min. 75mm thick). The top of the wall shall be provided with concrete coping (min. 50mm thick with 40mm projection on either side).

e. Barbed wire fencing

The details of barbed wire fencing shall be same as those for chain link fencing except providing barbed wires (4mm dia.) in place of chain-link mesh. The fence shall have 10 nos, of horizontal barbed wire lines and top 400mm height provided with 3 no. of barbed wire lines fixed to Y shaped angle supports welded to every angle post. Every 5th bay of the fence shall be provided with additional cross barbed diagonal wires.

f. Main Gate

i. The Main entry gate (2.5m height) shall be of rugged design with solid MS steel sections (20x20mm). The spacing of vertical members shall not be more than 125 mm.

ii. The gate shall be complete with MS flat guide track, castor wheel(s), GI fittings & fixtures like hinges, aldrop, locking arrangement, posts etc.

iii. The main gate shall be of 2.5m height and shall have 4.5m wide Gate for vehicular movement and an adjacent 1.5m wide wicket gate for pedestrian movement.

iv. The gate shall be provided with the Project name plate (2.5mx 1m, 3mm thick MS plate). The gate shall be painted with 2 coats of epoxy paint over 2 coats of suitable primer.

v. The gate shall be painted with 2 coats of epoxy paint of approved make and shade over 2 coats of suitable primer.

vi. All design and drawings for peripheral boundary fence/ Wall and Main gate shall be submitted for Engineer's approval before execution.

10.29.8 **Plant Layout**

a) The contractor shall submit drawing showing proposed Project Plant and SPV module Layout.

b) The Plant and SPV module layout shall be a comprehensive drawing showing various requirements of the project like, Reference coordinate grid, Geographical and Plant North, Layout of boundary fence including coordinates of all corner points, Location of main entrance gate and any other access gates as per project needs, Block wise FGL, Layout of main approach road to the plant, Internal and peripheral roads, Security Room/ cabin (s), all Buildings and Open installations with coordinates, Temporary Storage yard/ facility to be used by the contractor during construction, Contractor's & Engineer's site office, Proposed Array layout, Lightening arrester, UG/Over ground water Tank(s), Storm water drains, Corridor for buried cables etc.

c) The cable corridor shall be laid through clear gap between arrays and shall not be laid below modules for easy maintenance.

d) All the facilities and buildings shall be presented with suitable Legend.

e) The drawing shall be in suitable scale to have proper representation of the information.

f) The Plant & SPV module layout drawing shall be submitted by the contractor for review / approval by the Engineer.

10.29.9 **Design Loads**

a) Unless otherwise specified elsewhere, Dead load, Live load, Wind load and Seismic load for buildings and structures shall be considered as per provisions of relevant BIS standards.

b) The following minimum imposed load as indicated for some of the important areas shall, however be considered for the design. If actual expected load is more than the specified minimum load, then actual load is to be considered.

S. No.	Area	Imposed (Live) Load
1	Roof	1.50 kN/ Sqm
2	Building floors (GF) & Grade Slab	10.00 kN/ Sqm
3	RCC Floors (General)	5.00 kN/ Sqm
4	Outdoor platforms, Stairs, Landing and Balconies, Walkway, Chequred plate & Grating (except cable trench cover)	5.00 kN/ Sqm
5	Road culverts & allied structures over drain & pipe crossings subjected to vehicular traffic	Design for Class – 'A' loading (Wheeled & Tracked both) as per IRC Standard
6	Underground structures such as Sump, Pit, Trench, Drain, UG tank etc.	In addition to Earth pressure and Ground water table at FGL, a surcharge of 10kN /Sqm shall also be considered. The structure shall be designed for following criteria – (a) Inside empty with outside fill+ surcharge and water table at GL & (b) Inside water with no fill & water table outs side
7	Pre-cast and chequred plate cover over cable trench	4.00 kN/ Sqm
8	a) Main access & Internal Roads	a) As per IRC SP 20 corresponding to vehicular traffic of 150 commercial vehicles per day and critical in-field CBR
	b) Peripheral Road	b) As per IRC SP 20 corresponding to vehicular traffic of 45 commercial vehicles per day and critical in-field CBR

c) Primary Loads

(i) Dead Load (DL)

(ii) Live Load (LL)

(iii) Snow Load (SnL)

(iv) Wind Load (WL) – Both along X & Z horizontal direction

(v) Seismic Load (EL) – Both along X & Z horizontal direction

d) Basic wind speed (V_b) at project site shall be taken as per IS 875 (part-3) unless otherwise specified elsewhere.

e) To calculate the design wind speed (V_z), the factors K_1 (probability factor or risk coefficient), K_2 (terrain roughness and height factor) and K_3 (topography factor) shall be considered as per IS 875 (Part-3) (However, minimum values for K_1, K_2 and K_3 shall be 1.0, 1.05 and 1.0 respectively)

f) In case of plant site within 60 km of sea coast, the importance factor for cyclonic region, 'k4' shall be taken as 1.15. Provisions of IS: 15498 shall also be followed to ensure general safety of the structure.

g) To calculate the design wind pressure 'pd', factors 'ka' (area averaging factor) and 'kc' (combination factor) shall be taken as 1.0. (The factor 'kd' shall be taken as 1.0 in case of plant site within 60km of sea coast).

h) The Seismic Load shall be considered corresponding to Earth quake zone at site as per IS: 1893 (Part- 4) with Importance factor 1.5.

i) The Snow Load shall be considered as per IS:875 (Part-4).

j) <u>Notes for WL on MMS</u>

WL shall be considered as detailed below for estimation of WL (±X, ±Z direction) under primary loads.

Load due to wind on side (exposed) face of respective MMS members (Drag force) for wind acting in (±) X & Z direction shall also be considered along with (i) & (ii) below.

(i) Load due to fair (positive pressure) wind direction on design tilt angles of MMS members for wind acting in (±) X, Z direction

(ii) Load due to adverse (negative pressure) wind direction on design tilt angles of MMS members for wind acting in (±) X, Z direction

k) <u>Design Load combinations</u>

Appropriate Load factors in LSM design for concrete structures and appropriate Factor of safety in WSM design (ASD) for all steel structures including MMS shall be considered as per relevant BIS standard. No increase in permissible stress is permitted in design of MMS

Following load combinations shall be considered in design:

(i) DL + LL

(ii) DL + LL ± WLx

(iii) DL + LL ± WLz (iv) DL + LL ± ELx

(iv) DL + LL ± ELz

(v) DL + SnL ± WLx

(vi) DL + SnL± WLz

(vii) DL + SnL ± ELx

(viii) DL + SnL ± ELz

All buildings, structures and foundations shall be designed to withstand loads corresponding to worst design load combination.

10.29.10 **Foundations (General)**

a) Contractor shall design all foundations for buildings, equipment, HT line Towers, Switch yard structures, Transformer, MMS & other structures as per relevant BIS standards and recommendations of Geotechnical investigation report. The depth of foundation (below NGL) shall not be less than 1m except in case of chain link fencing post (for boundary & transformer yard fencing) where it shall not be less than 750mm (below NGL).

b) Min. thickness of PCC below brick wall shall be 150mm.

c) All foundations of one building shall be founded at same RL (Reduced level) with respect to foundation depth below lowest NGL (Natural ground level) in the building area. The Levels shall be obtained with reference to the already established TBM using digital survey instrument such as Total Station.

d) All design & drawings shall be submitted to the Engineer for approval before execution.

10.29.11 **MMS Foundation**

a) Module mounting structure (MMS) may be supported on isolated/ strip footing or pile foundation.

b) <u>Bored cast-in situ, Driven precast or under reamed Concrete pile</u>

i. In case the contractor proposes to provide concrete pile; the type, dia. and length of pile shall be as per recommendations of Geotechnical investigation report corresponding to prevalent soil characteristics at site. However, the min. dia. and depth of the pile shall be 300mm and 1800mm respectively except when very hard strata/ rock (N>100) is encountered at a higher level, the pile shall be extended in to the hard strata minimum 1.0 times the diameter of the pile with total depth of the pile not less than 1200mm below cut-off level.

ii. As specified above, the MMS support shall project minimum 200mm above FGL (Finished grade level) to avoid any damage to the MMS column/sub support due to direct contact of rain water/ surface run-off. This shall be ensured through either single stage construction of entire pile length including portion above FGL or by providing a collar (to be cast

in second stage) which shall project min. 75mm in plan beyond the pile face and shall extend min. 250mm below GL.

iii. For proper bonding, the surface of first stage concrete shall be made rough by trowelling and cleaning out laitance and cement slurry by using wire brush on the surface of joint immediately after initial setting of concrete. The prepared surface should be clean watered to get saturated dry condition when fresh concrete is placed against it. The prepared surface shall be applied with a suitable bonding agent before construction of pile cap/ collar as required.

iv. In case the column post/stub is supported through base plate-anchor bolt assembly, the same shall only be provided through RCC pile cap to be designed as per provisions of relevant BIS standard with min. clear overhang of 75mm. The pile shall be embedded min. 50mm in the pile cap and the pile reinforcement shall be extended in to the pile cap for proper anchorage.

v. In case of collapse of foundation strata during drilling of the pile bore, removable steel liner shall be used to maintain design depth and diameter of the pile for proper concreting.

vi. The design & installation of piles shall conform to IS: 2911.

vii. The bore shall be free from water before poring of pile concrete. For under water concreting termite shall be used.

c) Helical/ Screw Pile

i. The design, manufacture, testing and installation of Helical/ Screw pile shall conform to ICB-2009 and Practice Note 28- "**Screw Piles: Guidelines for Design, Construction & Installation,** ISSN 1176-0907 October 2015 (IPENZ Engineers New Zealand)"

ii. The design of pile shall be undertaken and verified by a suitably qualified geotechnical or structural Chartered Engineer with experience in the design of helical/screw piles.

iii. The pile shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by installation into the ground and service loads.

iv. The steel grade for pile shaft, helix plates and other accessories shall be with min. Fy 350 MPa. Min. thickness (BMT) of shaft and helix plate shall be 6 and 8mm respectively in case of coastal installations and soils containing aggressive chemicals and at other project sites it shall be respectively 5 and 6mm. Cap plate and col base plate shall be min. 12mm thick and of min. grade E-250 conforming to IS:2062.

v. All materials shall be hot dip galvanized conforming to relevant BIS standard with min. thickness of galvanization 80 microns.

vi. Wherever the pile shaft is required to be infilled with concrete grout, the same shall be of min. grade M30 (anti shrink).

vii. The allowable axial design load (Direct compression & Pull out), Pa, of helical piles shall be the least of the following values:

- Sum of the areas of the helical bearing plates times the bearing capacity of the soil or rock comprising the bearing stratum.
- Capacity determined from well-documented correlations with installation torque.
- Load capacity determined from initial load tests.
- Axial capacity of pile shaft.
- Axial capacity of pile shaft couplings.
- Sum of the axial capacity of helical bearing plates affixed to pile.

d) The lateral allowable load capacity of the pile shall be calculated using P-Y analysis and shall be verified with field trials. The allowable design lateral load shall be equal to the min. of (i) the total lateral load producing max. Lateral deflection of 5mm and (ii) 50% of the total lateral load at which the lateral displacement increases to 12mm.

e) Dimensions of the central shaft and the number, size and thickness of helical bearing plates shall be sufficient to support the design loads.

f) The Design Report shall include following details.

(i) Design loads

(ii) Geotechnical Strength Reduction Factors and supporting methodology

(iii) List of design standards

(iv) Design methodology and how specific loads such as seismic, lateral and settlement are addressed

(v) Founding stratum

(vi) Estimated length

(vii) Connection design and details between pile shaft & pile cap plate and Col base plate

(viii) Pre-production and production load testing to support design including acceptance criteria.

g) Helical piles shall be installed to specified embedment depth and torsional resistance criteria as per design. The torque applied during installation shall not exceed the maximum allowable installation torque of the helical pile

h) Special inspections shall be performed continuously during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required.

i) The installation of piles shall be done by an agency having adequate experience in helical pile construction.

j) The method statement for pre-production load testing (initial test) and construction of Helical Pile shall be submitted for review and approval. The method statement shall comply following requirements:

k) Helical pile pre-production load testing

The Piling Contractor shall provide a method statement for the pre-production load testing. The method statement shall be submitted 2 weeks prior to pile installation for testing and shall contain the following information (as a minimum):

- Programme of the testing, detailing the timing and sequence of each load test including any additional investigations proposed
- The general arrangement of the equipment
- A method for measuring the displacement at the head and toe of each test pile
- Template for the Pile load test report
- Confirming the criteria for determining the acceptability of the compression, tension and lateral load tests
- A contingency plan in the event that a load test is deemed not acceptable
- A procedure for verifying the capacity for each individual pile, this may include correlating the installation torque for each pre-production pile with the load test results
- All pile load tests shall be supervised by suitably experienced personnel, who are competent to operate, monitor and record each test throughout its duration. Each pile load test shall be continuously monitored throughout its duration.

l) Helical Pile Construction

The contractor shall provide a method statement for each piling operation to be undertaken in executing the Works. The method statement shall describe all proposed equipment and detail the construction sequence. The method statement shall be submitted with the tender and shall contain the following information (as a minimum):

- Programme of the works, detailing the timing and sequence of individual portions of the works
- Full details of the installation plant to be used, including manufacturer's information and proof of servicing/recent upkeep and calibration
- Proposed phasing of excavation/filling operations such that the design stresses in the piles (and any supporting frames) are not exceeded
- The contingency plan to be adopted, to minimize disruption and delay, in the event of encountering obstructions
- Anticipated noise levels (measured in dB) and vibration levels (measured in mm/sec) arising from piling operations (if applicable)

m) The Piling Contractor shall nominate a suitably experienced, professionally qualified engineer, as the "Piling Supervisor".

n) The Contractor shall also carry out routine tests on 0.5 % of the total no. of working/ job piles as per provisions of IS: 2911 (Part 4). In case of unsatisfactory results, min. no. of routine tests may be increased up to 2% of the total no. of working/ job piles as per the directions of the Engineer.

10.29.12 **Module Mounting Structure (MMS)**

a) The module mounting structure design shall generally follow the existing land profile. The top of the table shall be in one plane.

b) In MMS analysis the column support shall be assumed at EGL/NGL.

c) In case of topographical variations more than 3o, the contractor shall carry out detailed study of its effect on array layout, shadow analysis and structural stability of MMS.

d) The structure shall be designed to allow easy replacement of any module and shall be in line with site requirements.

e) The MMS stub/ column, rafter, purlin, ties and bracing members shall conform to following Indian standards.

- IS: 2062 – Hot rolled Medium and High tensile structural steel
- IS: 811 – Cold formed light gauge structural steel sections
- IS: 1161 – Steel tubes for structural purposes
- IS: 4923 – Hollow steel sections for structural use
- Minimum grade of steel for sections conforming to IS: 811 & IS: 4923 shall be E350 conforming to IS: 2062 and YSt 310 conforming to IS: 1608 respectively.

f) The contractor can also propose new light gauge structural steel or structural aluminium sections other than specified in IS: 811 subject to approval of the Engineer. In this case the contractor shall submit his proposal stating the technical advantages of the proposed sections for Engineer's review along with supporting literature and sample design calculations conforming to present specifications at the time of bidding.

g) The minimum thickness excluding anti corrosive treatment (BMT) of various elements of MMS structure shall be as following:

- Stub / column – 3.15mm,
- Rafter – 2.5mm &
- Purlin & other members – 2.0mm

h) The primary loads and load combinations for design of MMS structure shall be as specified under Clause No. 10. The design shall be done by Working stress method and no increase in allowable stress shall be permitted.

i) The maximum permissible deflection/ side sway limits for various elements of MMS under serviceability conditions shall be as following:

- Lateral deflection/ side sway for Column – Span/ 240
- Vertical deflection for Rafter and Purlin – Span/ 180
- Lateral deflection for Purlin – Span/240

j) In case of natural frequency in first mode less than 1 Hz, the design of the MMS structure shall also be checked against dynamic effects of wind as per provisions of IS – 875 (Part-3) using gust factor method.

k) The purlins shall be provided with following min. 10mm dia. GI sag/ tie rods or 30x30x2 GI tie angles:

- 1 no. tie rod in middle of each span
- 1 no. diagonal tie rod at each corner in end spans

l) Lateral restraint to compression flange if any due to PV panels is not permitted in purlin design.

m) The vertical diagonal bracing shall be provided in alternate spans of each unit (table) of MMS.

n) MMS shall support SPV modules at a given orientation & tilt and shall absorb and transfer the mechanical loads to the ground properly.

o) Welding of structure at site shall not be allowed and only bolted connections shall be used.

p) The MMS structure shall be hot dip galvanized with minimum GSM 610 kg/ sqm and/or minimum coating thickness of 80 microns for protection against corrosion. Galvanization shall conform to IS-2629, 4759 & 4736 as applicable.

q) It is to ensure that before application of this coating, the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or any foreign material likely to interfere with the coating process.

r) The bidder shall ensure that inner side is also provided with galvanization coating.

s) The galvanization shall be done after fabrication of members and cutting of holes to ensure galvanization of all cut/ exposed edges.

t) In case the proposed section is made up of Aluminum, anodized coating shall be Gr. AC25 and shall conform to IS: 1868.

u) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.

v) All fasteners and washers (2 round + 1 spring) both for MMS connections and fixing of PV Module shall be adequately protected from atmosphere and weather prevailing in the area.

w) Fasteners and washers to be used for erection of mounting structures and those for fixing Module over MMS shall be of stainless-steel grade SS 304 & SS 316 with property class A-70 conforming to relevant ISO standard and must sustain the adverse climatic conditions to ensure the life of the structure for 25 years.

x) Min. diameter of bolt for MMS connections shall be 10mm except for column-rafter connection where it shall not be less than 12mm (not less than 16mm with bushing in case of single bolt connection for seasonal tilt)

y) Modules shall be clamped or bolted with the structure properly. The material of clamps shall be Al / SS – 316 having weather resistant properties. Clamp/bolt shall use EPDM rubber and shall be designed in such a way so as not to cast any shadow on the active part of a module.

z) MMS column post supported with base plate secured to foundation shall be fixed with galvanized high strength “J” bolts conforming to specifications of IS: 4000/ IS: 1367 and relevant IS code Installation of foundation bolts and embedment of column leg in foundation concrete shall be done by using template to ensure proper alignment. The underside of base plate shall be provided with anti- shrink grout.

aa) In case the contractor proposes to extend the column leg to embed it in the pile as an alternate fixing arrangement, the column member shall be extended for full depth of the pile (100mm cover at tip of the pile) with an end plate of min. 4mm thickness to be fixed at the bottom of column leg. (However, for plants in coastal area or in case of marshy soil the column post shall be supported only with base secured to foundation through base plate and anchor bolt assembly and no embedment of column leg in foundation is permitted)

bb) The area of c/s of embedded leg shall not be less than 0.8% of pile cross sectional area.

cc) The array structure shall be grounded properly using maintenance free earthing kit.

dd) The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.

ee) The Bidder should design the structure height considering highest flood level at the site and the finished grade level. The minimum clearance between the lower edge of the module and the finished grade shall be the higher of (i) Highest flood level + 100mm and (ii) 500 mm, as applicable

ff) The length of one unit (Table) of MMS shall not generally be more than 20m.

gg) The contractor shall submit the detailed design calculations and drawings for MMS structure, bill of materials and their specifications/ standards to the Engineer along with STAAD report for approval before start of fabrication work.

10.29.13 **Concrete Works**

a) Construction of all RCC works shall be done with approved design mix as per IS 456 and the materials used viz. Cement, coarse & fine aggregate, Reinforcement steel etc. shall conform to relevant BIS standards.

b) Unless otherwise specified elsewhere, PCC shall be of min. grade M10 (nominal mix 1:3:6) except for mud mat, back filling of ground pockets or leveling course which shall be of grade M7.5 (nominal mix 1:4:8).

c) Reinforcement steel shall be of high strength TMT bars of grade Fe500 D conforming to IS: 1786. Ductile detailing in accordance with IS: 13920 shall be adopted for superstructure and sub-structure of all RCC buildings and structures.

d) Unless specified otherwise for grouting works anti shrink ready mix grout of approved make or cement mortar (CM) grout with non-shrink compound shall be used. The grout shall be high strength grout having min. characteristic strength of 35 N/mm^2 at 28 days.

10.29.14 **Miscellaneous Steel Works**

a) Unless otherwise specified elsewhere, all structural steel work shall be designed as per provisions of IS: 800 with working stress method of design (WSD).

b) Structural steel hot rolled sections, flats and plates shall conform IS: 2062, structural Pipes shall be medium (M)/ high (H) grade conforming to IS: 1161, chequered plate shall conform to IS: 3502 and Hollow steel sections for structural purposes shall conform to IS: 4923.

10.29.15 **Buildings**

a) General Requirement

i. The following terminologies shall be referred for designating various buildings in the plant.

ii. Plant buildings/ open installations are required to be constructed for housing the electrical equipment/ panel (Local Control Room Building – LCR) and Control room cum office cum store (Main Control Room – MCR) for operation and maintenance of Photovoltaic Solar Power Plant. Security room at main gate & Security cabin(s) (at strategic locations) shall also be provided to secure the plant from any theft/ burglary/unauthorized entry.

iii. Unless otherwise specified elsewhere, all buildings except Security room/ cabin shall have RCC framed structure. Brick partition walls shall be provided for Kitchen, Pantry, Battery room and Toilet units. For other rooms AL Glass partitions shall be provided. The equipment area shall be designed with OEM requirements to ensure all satisfactory operations. The security room/ cabin(s) shall be of prefabricated structure.

iv. All buildings shall have provision of adequate windows for natural light & ventilation, fire safety provisions and shall be designed as per provisions of National building code (NBC).

v. The contractor shall submit the proposed equipment layout drawings to the Engineer for approval before development of Architectural drawings. The building layout, exterior elevations shall be aesthetically designed following good architectural practices to get a pleasant look. Horizontal/ vertical bands through projections/ groves in external plaster may be provided to break the monotony. Roof slab shall have projection of 450mm beyond external walls with RCC parapet wall of 450 mm clear height all-around which shall form a projected band at roof level. For weather protection all doors and windows shall be provided with 450mm wide RCC chajja. However, chajja for rolling shutter shall be 750mm wide.

vi. MS staircase shall be provided for access to the roof of all RCC buildings.

b) Functional requirements

i. MCR Building

For operation & maintenance of SPV Plant, unless otherwise specified elsewhere, Control room cum office area of MCR building shall provide following facilities.

- Air-conditioned area (with provision of split A/C unit of adequate capacity) for SCADA room (min. carpet area 12m), Conference room (min. carpet area 20 m^2) & Supervisor cabin and office area (min. carpet area 20 m^2)
- Inverter/ Switchgear, equipment room(s) as per OEM requirements
- Store cum record room (min. carpet area 15 m^2)
- Battery room as per requirement
- Toilet block with separate gents and ladies wash room facilities (min. total carpet area 12 m^2)
- Pantry with service platform and utensil washing facilities (min. carpet area 5 m^2)
- Suitable provision for passage (for smooth movement of O & M personnel), cable trenches, operating area etc. (min. clear width 1500mm)

ii. LCR Building

- Unless otherwise specified elsewhere, LCR consists of data loggers, battery, Inverter, Electrical panels etc. as per requirement. There shall be suitable provision for easy/ smooth passage for O & M personnel, cable trench, operating area etc.
- The size of LCR shall be provided as per OEM requirements. However, minimum clear height up to soffit of beam shall be 4m.
- In case LCR and MCR building facilities are clubbed in one single building, the Equipment area and Office cum Control room area shall be separated by a brick wall with provision of internal entry door.
- MCR building shall have separate main entry to office area plus a provision of fire exit door.
- Rolling shutters shall be provided for equipment room and store room.

iii. Security Room / Cabin

a) The Contractor shall provide required number of security cabins at strategic locations & at corners of the plot and 1 nos. security room at Main entry gate.

b) The Security room shall be of min. size 4m x 4m x 2.75m height. The Security cabin shall be of min. size 1.2 x 1.8m x 2.5m height.

c) Security room/ cabin shall be a pre-engineered & pre-fabricated structure. The walls and roof of the building shall be fabricated with double skin insulated sandwiched Al-Zn alloy coated high tensile steel metal panels (BMT- 0.5mm, Al-Zn alloy coating -150 GSM total on both sides). The insulation shall be of PUF with min. density 40 kg/ cum and adequate thickness. Roof shall be provided with suitable slope, not less than 100 to the horizontal (approx. 1V:6H) for proper drainage of rain water and shall project 300mm beyond the walls. The make and (color) shade of pre- coated metal panels shall be subject to approval by the Engineer. Min. thickness of color coating shall be 20 micron (DFT) excluding prime coat 5 micron (DFT). The coating system shall confirm to IS; 15965.

d) The Main security room shall be provided with one Aluminum (AL) glazed door (0.75m wide x 2.1m height) on one face and AL glazed sliding windows (1.2m width x 1.0 m height) with AL grill on remaining three sides. Security cabin shall have one AL glazed door (0.75m widex2.1m height) and 1 no. AL sliding window (0.8m width x 1.0 m height) with AL (anodized) grill on one side. All glazing shall be of clear float glass with thickness of 4mm for window and 6 mm for door panel.

e) The door and windows shall be provided with all necessary fitting and fixtures like handles, tower bolts, mortise lock for door, stays, door stopper etc. All AL sections for doors and windows shall be anodized (min. average thickness 25 microns) or polyester powder coated (min. DFT 50 microns) with approved color shade for protection against weather.

f) Specially coated/ SS self-drilling screws/ fasteners conforming to class 3 as per ASTM: 3566.1 and 3566.2 shall only be used for all connections.

g) Anchor/ foundation bolts shall conform to IS: 5624 and IS 800.

h) The Security Cabin may be installed on concrete M15 skid platform (min. 350 thick) with skin reinforcement shrinkage or shall be supported on RCC pedestal & foundations. The concrete platform shall project 200mm beyond the walls.

i) The Security Room shall be supported on RCC pedestal & foundations.

j) The Design and drawings shall be submitted for approval prior to fabrication and installation.

10.29.16 **Flooring, Skirting and Dado**

a) Store area, Equipment Room

40 mm thick Cement concrete (IPS) flooring (1:2:4), aggregate size 10 mm down, conforming to IS 2571 with 2mm thick Heavy-duty epoxy coating (Industrial grade) of approved make on top as per manufacturer specifications and 10mm thick matching skirting of 100mm height.

b) SCADA Room, Control cum Office Room, Supervisor Room and Lobby

40 mm thick heavy-duty vitrified tile (8mm thick) flooring with matching skirting of 100 mm height.

c) Battery Room

Acid / Alkali resistant tile flooring and 2100 height dado, Floor and dado tiles - 20mm and 12 mm thick respectively. However, in case of maintenance free batteries, vitrified tile (8mm thick) flooring and dado shall be provided.

d) Toilet

- 40 mm thick Ceramic tile (8mm thick) flooring and glazed tile (6mm thick) 2100 height dado.
- 20mm thick Granite stone finish over platform for wash basin.

e) Pantry

40 mm thick heavy-duty vitrified tile (8 mm thick) flooring and glazed tile (6mm thick) 2100 mm height dado, 20mm thick Granite stone finish over service platform.

f) Passage / Corridor

40 mm thick heavy-duty vitrified tile (8mm thick) flooring with matching skirting of 100 mm height.

g) Steps

Kota stone (20 thick) or 50 thick cement concrete (IPS) flooring conforming to IS 2571.

h) All items shall be of reputed make. Only Items with approved samples by the Engineer shall be used.

10.29.17 **Doors and Windows**

a. Doors, windows, louvers and ventilators shall be made of AL sections (minimum average thickness 2.5mm), industrial grade, anodized (grade AC25, min. thickness 25 micron conforming to IS: 1868) or with polyester powder coating (Total DFT 50 microns conforming to IS: 13871) and shall be of approved make & colour shade. All sections, fittings and fixtures shall be anodized (min. thickness of coating 20 micron). The window and door shutters shall be of clear float/ wired/ ground glass as per design/ functional requirements. The doors in toile area shall be of steel frame with solid core (MDF) flush shutter, 35mm thick, with laminated finish on both sides conforming to IS: 2202.

b. AL Louvers, duct/ ventilation openings shall be provided as per functional requirement.

c. All doors, windows and ventilators shall be provided with all necessary fittings and fixtures like handles, tower bolts, wind stays, hinges etc. of heavy-duty anodized AL. All doors shall be provided with hydraulic door closure of required capacity.

d. All windows shall be provided with suitable AL grill of anodized sections with adequate thickness for security purposes.

e. Clear float glass for window and door shutter shall be of min 4mm and 6mm thickness respectively. Wired/ ground glass where provided shall be of min thickness 6mm.

f. Entrance door and door in passage shall be min. 1.5m wide (double leaf) x 2.1 m height while door for Conference room and Store room shall be min. 1.2m wide x 2.1m height. All other doors shall be min. 1.0m widex2.1m height except for WC which may be of 0.8m width.

g. Rolling shutters shall be of required size and shall be made of cold rolled steel strips with adequate gauge thickness (min. 18 gauge) and shall conform to IS 6248. Rolling shutter shall be provided with all fixture, accessories, paintings etc. all complete and shall be mechanically operated type.

10.29.18 **Roofing**

a. The roof of all RCC buildings shall be provided with min. slope of 1:100 for effective drainage of rain water. The slope shall be achieved either by application of screed concrete of grade 1:2:4 (with 12.5mm down coarse aggregate) with min. 25mm thick CM 1:4 layer on top to achieve smooth surface to facilitate application of water proofing treatment.

b. The water proofing treatment shall be in situ five course water proofing treatment with APP (Atactic Polypropylene) modified Polymeric membrane over roof consisting of first coat of bitumen primer @ 0.40Kg per sqm, 2nd & 4th courses of bonding material @ 1.20 kg/sqm, which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, 3rd layer of roofing membrane APP modified Polymeric membrane 2.0 mm thick of 3.00 Kg/sqm weight consisting of five layers prefabricated with centre core as 100 micron HMHDPE film sandwiched on both sides with polymeric mix and the polymeric mix is protected on both sides with 20 micron HMHDPE film. The top most layer (5^{th} layer) shall be finished with brick tiles of class designation 10 grouted with cement mortar 1:3 (1 cement: 3 fine sand) mixed with 2% integral water proofing compound by weight of cement over a 12 mm layer of cement mortar 1:3 (1 cement: 3 fine sand) and finished neat. The water proofing treatment shall be extended over golla/ fillet and inner face of the parapet up to 450mm height.

c. The corners at parapet wall and slab shall be provided with 50 thick fillet/ golla in CM 1:3 with neat finish.

d. Required no. of rain water down take pipes min. 100mm dia. PVC pipes (UV resistant), with 450x450mmx15mm deep khurra and MS grill at inlet shall be provided for rain water disposal.

10.29.19 **Plinth protection and drain**

a) 750mm wide plinth protection with min. 75mm thickness of PCC (1:3:6) over 75 mm thick bed of dry brick ballast, 40mm nominal size well rammed and consolidated and grouted with fine sand, shall be provided around all the buildings.

b) A peripheral drain (except for Security room/ cabin) of min. internal size 250mm x 250mm with brick walls in CM 1:6 over 75mm thick PCC (1:3:6) bedding with 12mm thick plaster in CM 1:5 and 25thk PCC (1:3:6) coping at top shall be provided along the periphery of the plinth protection for collection and disposal of rain water from building roof.

10.29.20 **Plinth filling for buildings**

Plinth beam, when provided, shall be taken minimum 200mm below FGL. The plinth filling below Ground floor (GF) for all buildings shall be provided with following specifications.

(i) Well compacted sub-grade

(ii) Well compacted bounder soling with interstices filled with sand over compacted sub- grade.

(iii) 75 mm thick PCC 1:3:6 over (ii)

(iv) 100 mm thick PCC 1:2:4 over (iii)

(v) 0 mm thick floor finish over (iv)

10.29.21 **Anti- termite Treatment**

In case of presence of termites at the project site, an anti-termite treatment shall be provided for all foundation pits and building plinth in MCR / LCR building conforming to IS: 6313 to control entry of termites.

10.29.22 **Plumbing & Sanitary Works**

a) Toilet block shall have following min. fittings:

- Wall mounted WC (Western type) 390 mm high with toilet paper roll holder, low height flushing tank and all fittings
- A set of 2 wall mounted Urinals (430 x 260 x 350 mm size) with flushing tank and all fittings (Gent's wash room only)
- Wash basin (550 x 400 mm) over concrete platform with all fittings including 2-pillar cocks
- Wall mirror (600 x 450 x 6 mm thick clear float glass) with hard board backing
- CP brass towel rail (600 x 20 mm) with C.P. brass brackets – one each in common area and bathroom (bathroom if applicable)
- Soap holder and liquid soap dispenser one each in common area and bathroom (bathroom if applicable)
- Shower and mixer for hot and cold water in bathroom (if applicable)
- Ventilators – Mechanical exhaust facility of adequate capacity
- Overhead PVC water storage tank – Capacity 1000 litres (common for both wash rooms) (2000 litres in case bathroom is to be provided)

b) Pantry room shall be provided with kitchen sink cum drain board and provision for installation of Water Cooler.

c) One toilet room with provision of WC and Wash basin shall be provided at Security Room near main gate.

d) Necessary plumbing lines for MCR/LCR building and Security Room near main gate.

e) All sanitary ware, fittings and fixtures shall be of reputed Make and Type and approved by the Engineer. All fittings, fastener, grating shall be of CP brass conforming to relevant BIS standards.

10.29.23 **Painting & Other Finishes**

Painting and white wash / colour wash for the buildings shall conform to relevant BIS standards. The make and colour shade of the finish shall be as advised and approved by the Engineer.

Internal Walls except toilets & battery room	Acrylic emulsion (for MCR) & Oil bound distemper (for LCR / Security Room)
Battery room	Acid/ Alkali resistant tiled dado of 2100 mm height & Acid resistant resin-based epoxy paint above dado (Vitrified tile flooring and dado with oil bound distemper in case of maintenance free batteries)
Toilet	Oil bound distemper
External Walls	All weather proof cement based acrylic emulsion paint, exterior grade
MMS foundations / Earth pit Enclosure	Cement paint
Underside of roof slab	White wash
Air-conditioned areas	Underside of roof slab- Under deck insulation with 50mm thick mineral wool, min. density 45 kg/ m3 and Gypsum board false ceiling with GI grid/ Gypsum tile (600x600 mm x 12 thick) false ceiling with AL grid as per manufacturer's details
Structural steel work	2 coats of synthetic enamel paint over 2 coats of suitable primer

10.29.24 **Air conditioning & Ventilation for MCR / LCR**

a) In MCR / LCR, SCADA room, Conference room, Supervisor cabin and Office room shall have split type air conditioning units.

b) All other rooms except equipment room shall be equipped with appropriate numbers of fans for effective heat dissipation.

10.29.25 **Fire Extinguishers**

a) All buildings shall be installed with required no. of fire extinguishers as per relevant BIS standard and NBC. Liquefied CO2/ foam/ ABC type fire extinguisher shall be upright type of capacity 10kg conforming to IS: 2171, IS: 10658.

b) The fire extinguisher shall be suitable for fighting fire of Oils, Solvents, Gases, Paints, Varnishes, Electrical Wiring, Live Machinery Fires, and all Flammable Liquid & Gas.

10.29.26 **Sand buckets**

a) Sand buckets shall be wall mounted made from at least 24SWG sheet with bracket fixing on wall conforming to IS: 2546.

b) All buildings shall be provided with required no. of sand buckets as per relevant BIS standard and NBC. 4 No. of Bucket stands with four buckets on each stand shall be provided in the Transformer Yard.

10.29.27 **Sign Boards and Danger Boards**

a) The sign board containing brief description of major components of the power plant as well as the complete power plant in general shall be installed at appropriate locations of the power plant as approved by Engineer

b) The Signboard shall be made of steel plate of not less than 3 mm. Letters on the board shall be with appropriate illumination arrangements.

c) Safety signs, building evacuation plan and direction signs, assembly points shall also be placed at strategic locations.

d) The Contractor shall provide to the Engineer, detailed specifications of the sign boards.

10.29.28 **Masonry Work**

a) The masonry work shall be of bricks, laterite blocks (as per site conditions) or concrete blocks.

b) All external walls of buildings shall be 230mm and internal walls shall be 230mm or 115mm as per requirements.

c) All concrete block masonry walls shall be min. 200mm thick.

d) Brick work shall be in cement mortar (CM) 1:6 & 1:4 for 230 mm and 115 mm thick brick wall respectively unless specified.

e) Unless otherwise specified elsewhere, Bricks shall be of class designation 7.5 conforming to IS: 1077, IS: 2212 & IS: 3495.

f) All concrete blocks shall be of min. compressive strength of 7.5 N/mm2 and shall be of Grade-A conforming to IS: 2185.

g) The laterite blocks shall conform to IS: 3620.

h) All buildings shall be provided with suitable damp-proof course (DPC). The DPC shall be with PCC (1:2:4) using 6 down coarse aggregate and water proofing admixture. The min. thickness of DPC shall be 40mm.

i) The construction of brick masonry shall conform to IS: 2212. Construction of Concrete block masonry shall conform to IS: 2572.

10.29.29 **Plastering, Pointing & Coping Works**

a) All brick masonry work shall be provided with plaster.

b) Wall and ceiling plaster shall be in cement mortar (CM) 1:6 and 1:3 respectively.

c) Thickness of plaster shall be 18mm and 12mm respectively for rough and smooth surface of the masonry wall. The ceiling plaster shall be 6mm thick.

d) All joints in stone masonry shall be raked and pointed in cement mortar (CM) 1:3 except specified otherwise.

e) Exposed top surface of brick or stone masonry shall be provided with 25 mm thick plain cement concrete (PCC) coping (1:2:4) with trawl finish. All exposed coping shall be provided with suitable slope and projection for easy drainage of water.

f) All door and window chajja shall be provided with 10mm wide drip course.

10.29.30 **Building Water Supply & Plumbing Works**

a) C-PVC pipes shall be used for all internal building water supply works while all external water supply pipes shall be PVC conforming to relevant BIS standard.

b) Rain water pipe shall be of PVC conforming to relevant BIS standard.

c) All sewerage, waste water and ventilation pipes shall be of HDPE conforming to relevant BIS standard.

d) MCR / LCR building and Security room shall be connected to Sewage treatment facility including all associated works like Manholes etc

10.29.31 **Sewage Treatment facility**

a) The Contractor shall design & provide soak pit and RCC Septic tank for treatment of sewage and waste water from MCR/LCR building and Security room. The septic shall be designed as liquid retaining structure conforming to IS:3370 for design loads as specified under Clause No.10. However, in case of ground water within 1.5m of finished grade level or the soil strata being of low permeability (permeability ≤ 10-6 m/s) where septic tank and soak pit arrangement is not effective, suitable packaged sewage treatment plant of reputed make/manufacture shall be provided. The sewage treatment facility shall be of required capacity and of proven design suitable for total of 15 people.

b) The design and drawings shall be submitted for approval prior to execution.

10.29.32 **Pipe & Cable Trenches**

a) All trenches inside the building and transformer area shall be of RCC. The min. wall and base slab thickness shall be 100mm for depth ≤ 850mm and 150mm for depths > 850mm.

b) The trench shall be designed for lateral load due to external soil fill, ground water table at FGL and 5.0 KN/ Sqm surcharge. External trenches shall be kept min. 100mm above FGL to avoid entry of rain water. In case of straight length of the trench being more than 40m, suitable expansion joints with PVC water stop shall be provided.

c) Internal trenches (inside buildings) shall be provided with chequered plate (min. 8mm thick with angle stiffeners as required) covers while external trench shall have precast concrete covers.

d) Min. thickness of precast cover shall be 50mm. Both bearing edges of the cable trench and all edges of pre-cast concrete covers shall be provided with min. 50x50x6 mm edge protection angle with lugs.

e) The trench cover (chequered or pre – cast both) shall be provided with suitable lifting hooks.

f) As required suitable MS insert plates shall be provided on trench wall to support the cable rack/ pipe.

g) The trench bed shall have a slope of approx. 1(V):250(H) along and 1(V):50(H) across the length of the trench. The cable trench shall have a dewatering sump (s) of size 450x450x450 mm depth at suitable location to facilitate collection & pumping out of rain water from the trench.

h) The external buried cables shall be laid in excavated trench as specified under specifications for Electrical works. The sand for filling shall be of Grade – IV conforming to IS: 383.

10.29.33 **Transformer Yard Civil Works**

a) Transformer and equipment foundations shall be founded on piles/isolated spread footings or block foundation depending on the final geotechnical investigation report and functional requirements.

b) In case of transformer oil tank capacity ≥ 2000 litres, the transformer foundation shall have its own soak pit which would cover the area of the transformer and cooler banks, so as to collect any spillage of oil in case of emergency. The retention capacity of the soak pit shall be min. 1/3 volume of the transformer oil (excluding free space above gravel) and it shall be filled with granite stone gravel of size 40mm, uniformly graded, with 250 mm free space above gravel fill. The bottom floor of the soak shall have steep slope with a sump pit {not less than 1(v): 5 (h)} for quick drainage of and removal of oil in case of spillage.

c) In case of transformer oil tank capacity more ≥ 25000 litres, the soak pit shall be connected to a separate burnt oil pit through discharge pipe and shall be suitably sized to accommodate full oil volume (excluding free board above inlet pipe) of the transformer connected to it, without backflow. In this case the capacity of the soak pit may be reduced to min. 1/3rd of the total transformer oil volume. The burnt oil pit shall be further connected to oily water drainage system. The water

shall be discharged into the nearest drain by gravity flow or pumping after suitable treatment as per statutory and code provisions.

d) Both, the transformer soak including side walls and the burnt oil pit shall be of RCC.

e) The oil collection pit shall be provided with 20mm dia. MS rung ladder with 2 coats of epoxy paint over 2 coats of primer, a manhole & removable RCC cover. The inside of oil collection pit shall be plastered with 6 mm thick CM 1:6 and painted with 2 coats of epoxy paint over 2 coats of primer.

f) The area around the transformer and equipment shall be covered with uniformly graded granite stone gravel of size 40mm.

g) The area shall be provided with galvanized chain link fence of height min 1.8m with 3.5m wide gate. The specifications for fencing shall be similar to those specified under Cl. No. 31.3 except fence post which shall be of MS angle (ISA 50x50x6)

h) The Gate of size 3.5m shall be of MS pipe (medium class conforming to IS: 1161) frame with hard drawn steel wire fabric mesh (50x50mmx3mm thick conforming to IS: 1566) including all accessories and fittings.

i) In addition to main gate a wicket gate of MS pipe (medium class conforming to IS: 1161) frame with 1.0 m width with hard drawn steel wire fabric (50x50x3mm thick conforming to IS: 1566) shall be provided for man entry for maintenance purpose.

j) The transformer yard fencing work shall conform to CEIG requirements.

k) The requirement of fire barrier wall between transformers shall be as per Electricity Rules and IS: 1646 recommendations. Minimum wall thickness shall be 230mm for RCC wall and 300mm for masonry wall.

10.29.34 **Water Supply & Cleaning of Modules**

a) The contractor shall design and install the effective module cleaning system.

b) A regular supply of suitable quantity of water shall be ensured by the contractor to cater day-to-day requirement of drinking water and for cleaning of PV modules during entire O&M period. For this necessary RO plant with bore well complete with suitable water pumping system shall be installed.

c) The Contractor shall estimate the water requirements for cleaning the photovoltaic modules at least once in two weeks or at closer frequency as per the soiling conditions prevailing at site, in order to operate the plant at its guaranteed plant performance. Also, the contractor is required to plan the water storage accordingly with provision of a tank of suitable capacity for this purpose. However, min. consumption of 2 Ltr / Sqm of surface area of SPV module shall be considered in estimation of required quantity of water storage.

d) Water used for drinking & PV module cleaning purpose shall generally be of potable quality and fit for cleaning the modules with TDS generally not more than 75 PPM. In case of higher salt contents, the water shall be thoroughly squeezed off to prevent salt deposition over module surface. However, water

with TDS more than 200 PPM shall not be used directly for module cleaning without suitable treatment to control the TDS within acceptable limits. The water must be free from any grit and any physical contaminants that could damage the panel surface.

e) If required, for settlement of any grit/ unacceptable suspended particles in the water a settling tank shall be installed before the inlet of the storage tank. Suitable arrangement for discharge/ disposal of sediment/ slush shall be provided in silting chamber by gravity disposal in surface drain or with provision of sludge sump and pump of adequate capacity.

f) The module cleaning system shall include construction of RCC tank or supply and installation of Ground mounted PVC tank (s) of required storage capacity, pumps (including 1 No. standby pump), water supply mains and flexible hose pipes, taps, valves (NRV, Butterfly valve, Ball valve, Gate valve, PRV, scour valve etc.), Water hammer arrester(s), pressure gauge, flow meter etc. as per the planning & design.

g) In case of over ground water storage tank, the contractor shall check its effect on plant performance through shadow analysis. The PVC storage tank shall conform to IS:12701. The valves shall conform to IS: 778. A suitable metal sheet canopy for protection from direct sunlight shall be provided over the tank area.

h) The water supply mains could be either of GI, uPVC or HDPE, however, the vertical pipe connecting supply main to the discharge point shall be of GI.

i) Masonry chamber shall be provided for Main gate valve at pump end. Whereas, as per requirements, at other locations either a masonry or GI/ HDPE pipe chamber may be provided.

j) Module cleaning procedure and pressure requirement at discharge point shall be as per the recommendation of PV module manufacturer. However, discharge pressure at outlet shall not be less than 50 kg/cm2 (5 MPa).

k) All the pipes thus laid shall be buried in ground at least 150mm below FGL or laid above ground clamping on suitable concrete support blocks. In case of above ground piping only GI pipes shall be used.

10.29.35 **Underground Water Tank**

a) Suitable size of water tank should be designed and installed

b) The underground RCC tank shall be designed for following load conditions:

- External earth pressure + hydrostatic pressure due to ground water table (to be considered at FGL for design purposes) + Surcharge of 20 kN/ Sqm and Tank Empty.

- Tank full up to MWL and no external loads

c) The design shall conform to IS: 3370 with maximum crack width of 0.1mm for wall, bottom slab and roof slab. Min. grade of concrete shall be M30 (M35 in coastal areas, marshy and saturated soils) conforming to IS: 456. Suitable

construction joints shall be provided as per provisions of IS: 3370 (Part 1). Water proofing admixture conforming to relevant BIS standard and of approved make shall be added to concrete as per manufacturer's recommendations.

d) The underground water tank shall be tested for water tightness as per the provisions of IS 3370 (Part-4). In case any leakage is noticed the same shall be repaired by injection of cement grout installing suitable nozzles around affected areas. Outside face of water tank in contact with water and soil and underside of roof slab shall be painted with 2 coats of epoxy paint.

10.30 **Structures**

10.30.1 **Transmission Line Structures**

a) Galvanized 220 kV and 132 kV Transmission Line towers, Tower extensions & accessories and 11 kV, 22kV, 22kV & 33 kV transmission poles, towers & accessories shall be designed following latest guidelines of respective SEB (State electricity board)/ STU (State transmission utility) and got approved from them before execution. In absence of SEB/ STU guidelines REC (Rural Electrification Corporation) standards may be followed. Support at corner with angle > 100 shall be provided with a 4-pole structure or a lattice tower structure. Use of PCC spun pole and RCC pole is not acceptable.

b) Approved copies of these designs & drawings shall be submitted to the employer for reference and record.

10.30.2 **Miscellaneous structures**

a) Support structure for weather monitoring device

i. Weather monitoring device shall be mounted on tubular steel pole of required height. The pole shall conform to IS: 2713.

ii. The pole shall be secured to an independent RCC foundation structure through Base plate and Anchor bolt assembly.

iii. 200 long 20 dia. rods shall be welded to the pole at 300 mm C/c for access to the device for maintenance purpose.

iv. The support structure shall be hot dip galvanized.

b) Support structures for SCB

v. SCB shall not be supported from MMS and shall have an independent structural steel supporting frame of galvanized ISMC 75, secured to an independent RCC foundation structure.

vi. The support structure shall be of adequate height to ensure either min. ground clearance of 1.2m to SCB unit or HFL + 100mm, whichever is higher.

vii. Lightning Arrester Mast and Foundation

viii. The LA mast shall be a self-supporting structure with GI tubular pole of required height. The pole shall confirm to IS: 2713.

ix. The pole shall be secured to an independent RCC foundation structure through Base plate & Anchor bolt assembly.

10.31 Quality Assurance and Inspection of Civil Works

10.31.1 Introduction

a. This part of the specification covers the sampling, testing and quality assurance requirement (including construction tolerances and acceptance criteria) for all civil and structural works covered in this specification.

b. This part of the technical specification shall be read in conjunction with other parts of the technical specifications, general technical requirements & erection conditions of the contract which covers common QA requirements. Wherever IS code or standards have been referred they shall be the latest revisions.

c. The rate for respective items of work or price shall include the cost for all works, activities, equipment, instrument, personnel, material etc. whatsoever associated to comply with sampling, testing and quality assurance requirement including construction tolerances and acceptance criteria and as specified in subsequent clauses of this part of the technical specifications.

d. The QA and QC activities in all respects as specified in the technical specifications/ drawings / data sheets / quality plans / contract documents shall be carried out at no extra cost.

e. The contractor shall prepare detailed construction and erection methodology scheme which shall be compatible to the requirements of the desired progress of work execution, quality measures, prior approvals from statutory authorities etc. if any and the same shall be got approved from the Engineer.

f. If required, work methodology may be revised/ reviewed at every stage of execution of work at site, to suit the site conditions, work progress commensurate with project schedule by the contractor at no extra cost to the Engineer

10.31.2 QA and QC Manpower

a. The contractor shall nominate one overall QA coordinator for the contract detailing the name, designation, contact details and address at the time of post bid discussions.

b. All correspondence related to Quality Assurance shall be addressed by the contractor's QA coordinator to the Engineer.

c. Employer/ Consultant shall address all correspondence related to Quality issues to the contractor's QA coordinator. The contractor's QA coordinator shall be responsible for co-ordination of Quality activities between various divisions of the contractor and their sub-vendors on one hand & with Engineer on the other hand.

d. The contractor shall appoint a dedicated, experienced and competent QA & QC in- charge at site, preferably directly reporting to the Project Manager, supported as necessary by experienced personnel, to ensure the effective implementation of the approved QAP.

e. The contractor shall finalize and submit a deployment schedule of QA & QC personnel along with their details to Engineer for approval/ acceptance and further shall ensure their availability well before the start of the concern activity.

10.31.3 **Laboratory and Field Testing**

a. The contractor shall make necessary provisions to provide all facilities required for QA & QC activities by setting up a field laboratory for QA and QC activities in line with the indicative field QA & QC laboratory set-up.

b. The Laboratory building shall be constructed and installed with adequate facilities to meet the requirement of envisaged test setup. Temperature and humidity controls shall be available wherever necessary during testing of samples.

c. The quality plan shall identify the testing equipment/ instrument, which the contractor shall deploy and equip the field quality laboratory for meeting the field quality plan requirements.

d. The contractor shall furnish a comprehensive list of testing equipment/ instrument required to meet the planned/scheduled tests for the execution of works for Engineer's acceptance/ approval.

e. The contractor shall mobilize the requisite laboratory equipment and QA & QC manpower at least 15 days prior to the planned test activity as per the schedule of tests.

f. In case contractor desires to hire the services of any established laboratory nearby for any field tests then he shall ensure that the subject laboratory is well equipped with all requisite testing facilities and qualified QA & QC staff and this shall not affect in anyway the work progress.

g. All equipment and instruments in the laboratory/ field shall be calibrated before the commencement of tests and then at regular intervals, as per the manufacturer's recommendation and as directed by the Engineer. The calibration certificates shall specify the fitness of the equipment and instruments within the limit of tolerance for use. Contractor shall arrange for calibration of equipment and instruments by an NABL / NPL accredited agency and the calibration report shall be submitted to Engineer.

h. The tests which cannot be carried out in the field laboratory shall be done at a laboratory of repute. This includes selected IITs, NCB, CSMRS, reputed government / autonomous laboratories / organizations, NITs and other reputed testing laboratories. The test samples for such test shall be jointly selected and sealed by the engineer and thereafter these shall be sent to the concerned laboratory through the covering letter signed by Engineer. Test report along with the recommendations shall be obtained from the laboratories without delay and submitted to Engineer.

i. Based on the schedule of work agreed with the Engineer and the approved FQP, the contractor shall prepare a schedule of tests and submit them to the Engineer and organize to carry out the tests as scheduled/agreed.

10.31.4 **Sampling and Testing of Construction Materials**

a. The method of sampling for testing of construction materials and work / job samples shall be as per the relevant BIS / standards / codes and in line with the requirements of the technical specifications / quality plans.

b. All samples shall be jointly drawn, signed and sealed wherever required, by the contractor and the engineer or his authorized representative.

c. The contractor shall carry out testing in accordance with the relevant IS standards/ codes and in line with the requirements of the technical specifications / quality plans. Where no specific testing procedure is mentioned, the tests shall be carried out as per the best prevalent engineering practices and to the directions of the Engineer.

d. All testing shall be done in the presence of Engineer or his authorized representative in a NABL accredited / Govt. Laboratory acceptable to Engineer.

e. The test samples shall be jointly selected and sealed and signed by the Site-in-charge and thereafter these shall be sent to the concerned laboratory.

f. The test report along with the recommendations shall be obtained from the laboratory without delay and submitted to Engineer.

10.32 **Purchase and Service**

a. All structural steel shall be procured only from main steel producers In case of non- availability of some of the sections with main steel producers, the contractor may propose to procure the sections from the re-rollers of the main steel producers, the name of such re-rollers will have to be cleared by the Engineer for which details such as BIS approval, main steel producer's approval, past experience for production of sections of specified material, details of machines, plant, testing facilities etc.

b. Confirmation that the process control and manufacturing of steel sections by re-rollers shall be same as that of main steel producers, that billets for re-rolling will only be sourced from main steel producers shall be furnished with regard to re-roller.

c. For Module Mounting Structures (MMS), sources of steel other than those specified under this clause may also be used subject to the condition that they otherwise meet the requirements of the Technical Specifications / Bid documents. Even after clearance of re-rollers, induction of billets with identified and correlated Mill test certificates (MTC) in the process of re-rolling, sampling of steel, quality checks thereof and stamping of final product for further identification and correlation with MTC prior to dispatch shall be the responsibility of the contractor and these shall be performed in presence of the authorized representative of the main Contractor.

d. Reinforcement steel shall be procured only from main steel producers and Mill test certificates (MTC) shall be obtained and submitted to the Engineer for correlation.

10.33 **Field Quality Plan**

a. Well before the start of the work, the contractor shall prepare and submit the Field Quality Plans to Employer for approval, which shall detail out for all the works, equipment, services, quality practices and procedures etc. in line with the requirement of the technical specifications to be followed by the contractor at site.

b. This FQP shall cover all the items / activities covered in the contract / schedule of items required, right from material procurement to completion of the work at site.

c. An Indicative Field & Manufacturing Quality Plan for civil, structural and MMS works is enclosed with this specification for reference as Annexure – D.

10.34 **General QA Requirements**

10.34.1 The contractor shall ensure that the works, BOIs and services under the scope of Contract, whether manufactured or performed within contractor's works or at his subcontractor's premises or at the project site or at any other place of work, are in accordance with Technical specification, applicable standards / codes, approved drawings / data sheets / quality plans and BOQ. All the works, BOIs and services shall be carried out as per the best prevalent engineering practices and to the directions of the Engineer.

Equipment	UOM	Approx. Qty.
Cube moulds for cement testing	nos.	4
Sieve shaker	nos.	1
Sieve for sand, coarse and fine aggregate	set	1
Sieve for coarse aggregate	set	1
Slump testing equipment	nos.	6
Oven	nos.	2
Physical balance	nos.	1
Thermometer	nos.	4
Burret	nos.	2
Measuring cylinder	nos.	9
Measuring flask	nos.	3
Compression testing machine	set	1
Cube mould for concrete	nos.	10
Mechanical weighing machine	nos.	1 (100 kg capacity)
Drum type concrete mixer (for trial mixes)	nos.	1
Proctor testing equipment	set	1

10.34.2 Notes

- The equipment listed above is indicative and minimum required. Additional equipment, if any, required for successful completion of work shall be provided /arranged by the contractor.
- All test reports/ inspection reports shall be submitted in soft copy also and shall be available at site for easy access to the Engineer.
- Based on the schedule (L2/L3 Network), Quality control & Quality Assurance Work plan shall be finalized by the contractor and the same shall be submitted to Engineer for acceptance / approval.

END OF SECTION-X

SECTION–XI

FORMS AND FORMATS

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8	LIST OF WEG'S INSTALLED THRU TURNKEY PROJECTS (1500KW & ABOVE) & (15 MW SOLAR SYSTEM) IN INDIA DURING PRECEDING THREE YEARS
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Bid Response Sheet No 1

BIDDER'S GENERAL INFORMATION

To
Oil India Ltd;
2A District Shopping Center,
NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

Sub: Bid No. ---------- Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

1. Name of the bidder ----------

2. Status of Firm/ Company: [Mark √] Proprietorship Firm / Partnership Firm/ Company (Private or public)

   Consortium details:

   Lead Member ----------

   Other Member ----------

3. Number of years in the business ----------

   Lead Member ----------

   Other Member ----------

4. Registered Office Address: ----------

   Lead Member ----------

   Other Member ----------

4. Operational Address: ----------
   [If different from above] ----------

   Lead Member ----------

   Other Member ----------

6. Telephone No. & Fax No.: ----------

   Lead Member ----------

   Other Member ----------

7. E-mail ID & Website:

Lead Member ----------

Other Member ----------

8. Licensed wind capacity to manufacture:

Description of equipment	Size Capacity	Licensed Capacity	No. of units manufactured		
			Current Year	Last Year	Second Last Year

Licensed solar capacity to manufacture, if any:

Description of equipment	Size Capacity	Licensed Capacity	No. of units manufactured		
			Current Year	Last Year	Second Last Year

9. Plant Details:
   a) Location
   b) Description

10. Type of the wind equipment manufactured/supplied/installed during last 4 years.

Name of Equipment	Capacity/size/ Model	Nos. manufactured / supplied/ installed	Project to which supplies have been made	No. of orders in hand

Type of the wind equipment manufactured/supplied/installed during last 4 years.

Name of Equipment	Capacity/size/ Model	Nos. manufactured / supplied/ installed	Project to which supplies have been made	No. of orders in hand

Bid Response Sheet No 1 contd…

11. Details of testing facilities available at works (For solar and wind separately):
    a) List of testing equipment.
    b) Tests, which are carried out on items offered
    c) Details of the test organization available.

12. Describe Quality Control Organization, if any, and give the organization chart. (For solar and wind separately):

    a) Are goods offered subject to batch test, random sampling, or full 100% test for Quality check?
    b) Are tests carried out by factory employees or by a separate testing agency?
    c) Are independent quality Control Organization checks made and certificates issued?

13. ISO Certification [If any][If 'Yes', Please Furnish Details]: (For solar and wind separately):

14. Nearest service center to offered
    Location with phone number
    (For solar and wind separately):

15. Names of three buyers to whom similar equipment have been supplied, installed and commissioned in the past to which reference could be made by us regarding the bidder's technical and delivery ability.

    (For solar and wind separately):

16. Schedule for furnishing technical data for solar and wind separately, and certified drawings after receipt of orders.

Signature of Bidder

Bid Response Sheet No 2

LIST OF ENCLOSURES

To
Oil India Ltd;
2A District Shopping Center,
NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

Sub: Bid No. ---------- Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

Dear Sir,

We are enclosing the following documents as part of the bid:

(i) Power of Attorney of the signatory to the Bidding Document along with Board Resolution.

(ii) Documents showing Financial Situation Information for the last three years such as annual reports, profit and loss account, net worth etc. along with information as sought in Bid Response Sheet No 3

(iii) Copy of Bidding Documents along with addendum/corrigendum signed in token of confirmation that Bid Documents are considered in full while preparing the bid and in case of award, work will be executed in accordance with the provisions detailed in Bid Documents.

(iv) Documentary Evidences showing the Bidder's claim of meeting Bid Rejection Criteria as mentioned in Schedule ITB -1.

(v) EMD in the form of DD/ BG in favor of Oil India Ltd, Payable at Jodhpur from any Bank as per Annexure –V.

(vi) Proof of payment towards Bid Fee.

(vii) Copy of agreement confirming evacuation of full capacity generated power from the hybrid power project.

Signature of Bidder

Bid Response sheet No 3

FINANCIAL INFORMATION

FINANCIAL DATA FOR LAST THREE AUDITED FINANCIAL YEAR (For Lead and other member separately)

Sl. No.	Description	FY2016-17	FY2017-18	FY2018-19
1	Current Assets			
2	Current Liabilities			
3	Working Capital (1-2)			
4	Annual Turnover			
5	Paid up share capital			
6	Free Reserves & Surplus			
7	Net Worth of bidder funds			
8	Profits before taxes			

Attached are copies of the last three Annual Reports /audited balance sheets, including all related notes, and income statements as indicated above, complying with the following:

i) All such documents reflecting the financial situation of the bidder.

ii) Historic financial statements must be audited by a certified accountant and must be complete, including all notes to the financial statements.

iii) Historic financial statements must correspond to accounting periods already completed and audited (no statement for partial periods shall be accepted).

Signature of Bidder

Bid Response Sheet No 4(a)

LETTER OF AUTHORITY FOR ATTENDING SUBSEQUENT 'NEGOTIATIONS' / 'PRE-BID MEETINGS' / 'UN-PRICED BID OPENING' / 'PRICE BID OPENING'

[Performa for Letter of Authority for Attending Subsequent 'Negotiations' / 'Pre-Bid Meetings' / 'Un-priced Bid Opening' / 'Price Bid Opening']

Ref: Date:

To
Oil India Ltd;
2A District Shopping Center,
NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

Sub: Bid No. ---------- Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

Dear Sir,

I/We, ----------hereby authorize the following representative(s) for attending any 'Negotiations' / 'Meetings', 'Un-priced Bid Opening', 'Price Bid Opening' and for any subsequent correspondence / communication against the above Bidding Documents:

[1] Name & Designation: ----------
Signature: ----------
Phone/Cell: ----------
Fax: ----------
E-mail: ----------

[2] Name & Designation: ----------
Signature: ----------
Phone/Cell: ----------
Fax: ----------
E-mail:

We confirm that we shall be bound by all commitments made by aforementioned authorised representative(s).

Yours faithfully,

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:
Designation & SEAL

Note: This "Letter of Authority for attending subsequent 'negotiations' / 'Pre-bid meetings' / 'Un-priced bid opening' / 'Price bid opening' " should be on the "letterhead" of the Firm / Bidder and should be signed by a person competent and having the 'Power of Attorney' to bind the Bidder. Not more than 'two [02] persons per Bidder' are permitted to attend Pre-bid meeting, "Techno-commercial / Un-priced" & "Price Bid" Openings.

Bid Response Sheet No 4(b)

PROFORMA OF LETTER OF AUTHORITY

TO

Oil India Ltd;
2A District Shopping Center,
NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

Sir,

Sub: OIL's Bid No. _____

We _____ confirm that Mr. _____ (Name and address) as authorized to represent us to Bid, negotiate and conclude the agreement on our behalf with you against Bid Invitation No. _____ for hiring of services for _____.

We confirm that we shall be bound by all and whatsoever our said representative shall commit.

Yours Faithfully,

Signature: _____
Name & Designation: _____
For & on behalf of: _____

Note : This letter of authority shall be on printed letter head of the Bidder and shall be signed by a person competent and having the power of attorney (power of attorney shall be annexed) to bind such Bidder. If signed by a consortium, it shall be signed by members of the consortium.

Bid Response Sheet No 5

DECLARATION

To
Oil India Ltd;
2A District Shopping Center,
NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

Sub: Bid No. ---------- Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

Dear Sir,

We hereby confirm that we are not under any 'liquidation', any 'court receivership' or similar proceedings and 'bankruptcy' and we agree that if any noticed in future, our Bid may be rejected / terminated.

In case the bidder has any dispute in court of law of any kind which can affect the manufacturing, supply, installation, commissioning of WEGs/ solar system & O&M Contract, in such case the bidder shall furnish the status of all cases along with all relevant documents.

Signature of Bidder

Bid Response sheet No 6

BID EVALUATION CRITERIA

Sub: Tender No. SJI3301P20 Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

.

Bidder's Name:

This Questionnaire duly filled in, signed & stamped must form part of Bidder's Bid and should be returned along with Un-priced Bid. Clauses confirmed hereunder need not be repeated in the Bid.

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
1	The bid shall conform generally to the specifications and terms and conditions given in this bid document. Bids shall be rejected in case the services offered do not conform to required parameters stipulated in the technical specifications. Notwithstanding the general conformity of the bids to the stipulated specifications, the following requirements will have to be particularly met by the Bidders without which the same will be considered as non-responsive and rejected. Bidders are advised not to take any exception/deviations to the bid document.	
A. TECHNICAL CRITERIA		
2	The bidder must be in the business of erection, installation, commissioning and O&M of wind and solar plants.	
3	Such EPC Projects/jobs/work(s) referenced for qualification in aforesaid para, must involve Engineering (detail engineering is mandatory), Procurement, Project management, Construction management including fabrication, transportation, installation, hook-up, testing, pre-commissioning, start-up, commissioning & PGTR (performance guarantee & test run).	
4	The Bidder must have Experience of having successfully executed one similar job as mentioned in aforesaid para of value not less than INR 250.50 Cr. by the bidders in the last 07 (Seven) years to be reckoned from the original Bid Closing date. The project, for which the above experience is claimed, should have been satisfactorily completed and/ or handed over / commissioned prior to the date of bid closing. Here similar works means wind power or/and solar projects covering supply, erection testing commissioning and comprehensive O&M for a period of minimum 5 years.	
5	The bidder must be a manufacturer of wind energy equipment; the offered model of WEG shall be of 1500 KW rating or above and a manufacturer of SPV modules with minimum designing, manufacturing and testing capabilities required for setting up the 10 MW (AC) Solar Project. And meets the experience criteria as	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	described OR System Integrator cum EPC contractor who have designed, engineered, installed tested and commissioned using tier one quality products for at least 10 MW (AC) Grid Connected Solar Power plants of offered technology.	
6	The bidder must have successfully designed, engineered, manufactured, supplied, erected and commissioned, on turnkey basis, Wind Power Project of aggregate capacity not less than 20.5 MW comprising of wind electric generators (WEGs) of unit rating of 1500 KW or above in any one year in the last 7 (seven) years as on Bid Closing Date and also should have experience of Minimum one number Grid connected Solar PV power plant of not less than 7 MW or more capacity from concept to commissioning (i.e. designed, erected, tested and commissioned) during the last seven (07) years from the original date of bid closing.	
7	The offered rating of WEGs should have been installed by the bidder and must have been working satisfactorily since last 2 (two) years and offered Model (of same rating) should have been commissioned as on the date of submission of the bid and Minimum one SPV Power Project of at least 10 MW (AC) capacity commissioned by the bidder in India, should be working successfully for at least one year from its date of commissioning from the original date of submission of the bid.	
8	The bidder must be presently in the business of operation & maintenance (O&M) of wind farms and must have the experience of successful operation and maintenance of at least one wind farm of 20.5 MW capacity or above in India, having WEGs of 1500KW capacity or above, for a period of at least 1 (one) year during last 7(seven) years period as on the Bid Closing Date and Minimum one SPV Power Project of at least 7 MW capacity commissioned by the bidder in India, should be working successfully for at least one year from its date of commissioning from the original date of bid closing.	
9	The quoted model of WEG must have Type Certification from an accredited test house such as RISO Denmark, DEWI- Germany, Germanischer LLOYD- Germany, NIWE or any other agency approved by Ministry of New and Renewable Energy (MNRE), Government of India. Such Type Certificate must be valid as on the Bid Closing Date. Copy of Type Certificate along with copy certified power curve shall be submitted with the bid. Certified power curve should be in graphics as well as tabular form.	
10	The bidder must have its name & the offered model included in the latest list of “Manufacturers of Wind Electric Generators / Wind Turbine equipment” in Table ‘A’ published by Ministry of New & Renewable Energy (MNRE), Government of India.	
11	The stabilized output of the offered Solar PV plant should not be less than 14 MW (AC) and for the Wind Plant 41MW (AC) ± 5% under standard conditions.	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
12	The bidder must be in possession of suitable and adequate land for the Wind plant, either government land on lease or private land, required for installation of the project. The land must have clear title and free from any encumbrances, encroachments or litigation. The bidder may have any of the following arrangements for having the land. Bidder already having possession of land in his own name. Allotment letter of revenue land in bidder's own name by the Government or by competent authority. If allotment letter is not available, then recommendation for allotment of land from the nodal agency will be considered subject to submission of allotment letter within 60 (sixty) days of techno commercial bid opening. A categorical confirmation in this regard have to be submitted by the bidder without which offer will not be considered for further evaluation. An Agreement with a third party (an individual or company) who is/are either in possession of private land or have been allotted Government land along with commitment to transfer such land to OIL INDIA without any consideration. The bidder shall furnish land details, Agreement with third party and commitment of the third party with his bid. Copy of sale deed in case of private land and a copy of allotment letter in case of Government land shall also be furnished with the bid. In case of Forest land, the bidder must have at least Stage -1 clearance from the Ministry of Environment and Forests. Bidders should submit all land related documents along with technical bid in OIL's e-portal. The bidder must give an undertaking that he will arrange the requisite land for the solar plant in the vicinity of the site offered for Wind Plant within 06 (Six) months from the date of issue of LoA. A categorical confirmation in this regard have to be submitted by the bidder without which offer will not be considered for further evaluation.	
13	Indian Company/Indian Joint Venture Company as bidder: In case the bidder is an Indian Company/Indian Joint Venture Company, either the Indian Company/Indian Joint Venture Company or its Technical Collaborator/ Joint venture partner must meet the criteria under above clauses. i. Details of experience and past performance of the bidder and the collaborator (in case of collaboration) or of joint venture	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	partner (in case of a joint venture), on works/jobs done of similar nature in the past and details of current work in hand and other contractual commitments, indicating areas and clients are to be submitted along with the Technical Bid, in support of the experience criteria laid down above. ii. Indian Companies/Joint Venture Companies: Indian bidders whose proposal for technical collaboration/joint venture involves foreign equity participation or payment of royalty and / or lump sum for technical know-how and wherever Govt. approval is necessary, are required to submit copy of Govt. approval, on their application submitted to SIA, prior to the date of price bid opening. Bidder must submit along with their technical bid Memorandum of Understanding (MOU)/Agreement with their technical collaborator / Joint venture partner (in case of Joint venture) clearly indicating their roles & responsibilities under the scope of work. iii. MOU/Agreement concluded by the bidder with technical collaborator/joint venture partner (in case of Joint Venture), must also be addressed to the Company, clearly stating that the MOU Agreement is applicable to this tender and shall be binding on them for the entire contract period. Notwithstanding the MOU/Agreement, the responsibility of completion of job under this contract will be with the bidder. iv. The MOU/Agreement should be legally valid i.e. it should be on a non-judicial stamp paper and notarised. In case of involvement of overseas bidder, the MOU / Agreement should be notarised / endorsed by Indian Embassy.	
14	20.0 In case the Bidder is a Consortium of Companies, the following requirements must be satisfied by the Bidder: In case of consortium bidding the members of the consortium should not be more than three. One of the members should be the leader of the consortium. The leader of the consortium can submit bid on behalf of consortium of bidders. Memorandum of Understanding (MOU) between the consortium members duly executed by the CEOs or authorized representative of the consortium members must accompany the bid which should clearly define role/scope of work of each partner/member and should clearly define the leader of the consortium and also authorizing the leader for signing and submission of Bid on their behalf. Memorandum of Understanding (MOU) must also state that all the members of consortium shall be jointly and severally responsible for discharging all obligations under the contract. However, the leader of the consortium must submit an undertaking along with the technical bid towards unconditional acceptance of full responsibility for executing the 'Scope of Work' of this bid document. The division in scope of work among Consortium Members shall commensurate with their past experience. The overall Project Management shall be performed by the Leader. All Members of the	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	Consortium shall assume responsibility jointly and severally and shall submit Agreement/MOU along with the Bid clearly defining the scope and responsibility of each member along with nomination of the Leader. This Agreement/MOU must remain in force at least till the end of Defects Liability Period and shall be extended if required as per the Company's advice. The following provisions should also be incorporated in the MOU executed by the members of the consortium: (i) In case of Consortium bidding, the Bidder is defined as a consortium of Solar & Wind manufacturers and developers with maximum 3 members. The leader of the Consortium may be either a solar or wind manufacturer/developer and he should meet the experience criteria of his respective stream (i.e. Wind / Solar). The other consortium member shall meet the experience criteria of the remaining stream i.e. wind / Solar. The Financial criteria (value) will be met by the leader of the Consortium only. (ii) Only the leader of the consortium shall submit bid on behalf of the consortium. The other members of the consortium shall rectify all the acts and decision of the Leader of the Consortium, which are taken in connection with and/or during the evaluation of the tender and execution of the contract. (iii) The bid security shall be in the name of the leader of the consortium on behalf of consortium with specific reference to consortium bid and name & address of consortium members. Similarly, the performance security shall be in the name of the leader on behalf of the consortium. (iv) The leader of the consortium on behalf of the consortium shall coordinate with OIL during the period the bid is under evaluation as well as during the execution of works in the event contract is awarded and he shall also be responsible for resolving dispute/misunderstanding/undefined activities, if any, amongst all the consortium members. (v) Any correspondence exchanged with the leader of consortium shall be binding on all the consortium /joint venture members. (vi) Payment shall be made by OIL only to the leader of the consortium towards fulfilment of the contract obligation. (vii) In case of consortium bids, the bid shall be digitally signed by the authorized representative of the leader of the consortium. The power of Attorney from each member authorizing the leader for signing and submission of Bid on behalf of individual member must accompany the bid, if the same is not mentioned in the MOU submitted along with the bid. (viii) Document/details pertaining to qualification of the bidder of document attached with the bidding documents must be furnished by each partner/member of consortium complete in all respects along with the bid clearly bringing up their experience especially in the form of work in their scope. (ix) The Consortium Leader and the distribution of work will be identified and set forth in the bid and will not be permitted to change thereafter without the consent of the Company. No change	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	in project plans, time tables or pricing will be permitted as a consequence of any withdrawal or failure to perform by a Consortium Member. (x) Constitution of consortium: If during the evaluation of bid, a consortium leader proposes any alterations/changes in the constitution or replacement or inclusion or expulsion of any partner(s)/member(s) of the consortium which had originally submitted the bid, to drive some advantages/benefits based on any development(s) having come to knowledge at any time, the bid of such a consortium shall be liable for rejection. (xi) Signing of contract: In the event of award of contract to the consortium, the contract to be signed by all the members of the consortium and the liability shall be binding to each member of the consortium jointly and severely. (xii) Members of the consortium are not allowed to quote separately/independently against this tender. All the bids received in such case will be summarily rejected. Further, all bids from parties with technical support from the same principal/Subsidiary/Co-Subsidiary/Sister subsidiary will be rejected. Joint venture partnership / collaboration, with a firm bidding as an independent identity against this tender, will not be accepted. (xiii) The consortium partners should satisfy the experience criteria as per Clauses above in their respective domain. (xiv) Certified copies (attested by Director/Company Secretary) of Board resolutions passed by respective Board of Directors of the companies (Consortium leader and members) agreeing to entering into such consortium with each other for submission of bid for the NIT and authorizing designated executives of each company to sign in the MOU to be provided along with the technical bid. (xv) The MOU/Agreement should be legally valid i.e. it should be on a non-judicial stamp paper and notarized. In case of involvement of overseas bidder, the MOU / Agreement should be notarized / endorsed by Indian Embassy.	
15	**Eligibility criteria in case Bid is submitted on the basis of the Technical Experience of the Parent/Subsidiary Company:** Offers of those bidders who themselves do not meet experience criteria as stipulated in clauses 1.0 to 14.0 above can also be considered provided the bidder is a wholly subsidiary company of the parent company which meets the above mentioned experience criteria or the parent company can also be considered on the strength of its wholly subsidiary company. However, the parent/subsidiary company of the bidder should on its own meet the technical experience as aforesaid and should not rely on its sister subsidiary/co-subsidiary company or through any other arrangement like technical collaboration etc. In that case, as the subsidiary company is dependent upon the technical experience of the parent company or vice-versa, with a view to ensure commitment and involvement of the parent/subsidiary company for successful execution of the contract, the participating bidder must enclose an agreement, as per format furnished vide **Attachment-I,**	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	between the parent and the subsidiary company or vice-versa and Parent/Subsidiary Guarantee, as per format furnished vide **Attachment-II**, from the parent/subsidiary company to OIL for fulfilling the obligations under the agreement, along with the technical bid	
16	Eligibility criteria in case Bid is submitted on the basis of the Technical Experience of Sister Subsidiary/Co-Subsidiary Company: Offers of those bidders who themselves do not meet the technical experience criteria stipulated in clauses 1.0 to 14.0 above can also be considered based on the experience of their Sister Subsidiary/Co-Subsidiary company within the ultimate parent/holding company subject to meeting the following conditions: (a) Provided that the sister subsidiary/co-subsidiary company and the bidding company are both wholly subsidiaries of an ultimate parent/holding company either directly or through intermediate wholly subsidiaries of the ultimate parent/holding company or through any other wholly subsidiary company within the ultimate parent/holding company. Documentary evidence to this effect to be submitted by the ultimate parent/holding company along with the technical bid. (b) Provided that the sister subsidiary/co-subsidiary company on its own meets the technical experience criteria laid down in clauses 1.0 to 14.0 above and not through any other arrangement like technical collaboration etc. (c) Provided that with a view to ensure commitment and involvement of the ultimate parent/holding company for successful execution of the contract, the participating bidder must submit an agreement, as per format furnished vide Attachment-III, between them, their ultimate parent/holding company, along with the technical bid	
17	A. In both the situations mentioned in 15 and 16 above, following conditions are required to be fulfilled /documents to be submitted: A-1. Undertaking by ultimate parent to provide a Performance Security (as per format enclosed as ANNEXURE-III), equivalent to 50% of the value of the Performance Security which is to be submitted by the bidding company, in case the supported bidding company is the successful bidder. In cases where foreign based ultimate parent does not have Permanent Establishment in India, the bidding company can furnish Performance Security for an amount which is sum of Performance Security amount to be submitted by the bidder and additional 50% Performance Security amount required to be submitted by the ultimate parent. In such case bidding company shall furnish an undertaking that their foreign based ultimate parent is not having any Permanent Establishment in India in terms of Income Tax Act of India. A-2. Undertaking from the ultimate parent to the effect that in addition to invoking the Performance Security submitted by the contractor, the Performance Security provided by ultimate parent shall be invoked by OIL due to non-performance of the contractor.	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	Note: In case ultimate parent fails to submit Performance Bank Guarantee as per A-1. Above, Bid Security submitted by the bidder shall be forfeited.	
18	The bids will be technically evaluated based on the requirements furnished in Scope of Work/Terms of Reference. Bids which do not conform to the minimum specifications of equipment, hardware and software furnished therein and do not include all the jobs/services mentioned in the tender document will be considered as incomplete and rejected.	
19	Bidder must submit detailed Bio-data of all key personnel to be deployed for the whole period of the project, along with the technical bid. Bidder shall deploy the same persons whose Bio-data is offered in the bid. They shall not be replaced or transferred without prior notification to the Company. Company's approval is essential in case they are desired to be replaced by the bidder with equally competent persons satisfying minimum experience criteria and Company's decision in this regard will be final.	
B. FINANCIAL CRITERIA		
15	Annual Financial Turnover of the bidder during any of preceding three financial/ accounting years from the original bid closing date should be at least INR 167 Cr. In case of consortium At least one (01) member of the consortium to meet above criteria of annual financial turnover of at least INR 167 Cr. The other members of the consortium should meet minimum criteria of annual turnover of INR 83.5 Cr.	
16	Net Worth of the bidder: It should be minimum INR 50.1 Cr., as per immediate preceding audited financial year result. In case of consortium, the Net Worth of all the members of the consortium should be positive. The members of consortium collectively should meet the net worth minimum INR 50.1 Cr., as per immediate preceding audited financial year result. Net worth of individual members of the consortium should be positive on stand-alone basis. Net worth shall mean: " Share capital + Reserves created out of profits and securities Premium - account (excluding revaluation reserves) - deferred expenditure - Miscellaneous Expenditure to the extent not written off and carried forward Loss - Reserves created out of write back of depreciation and amalgamation".	
17	Documentary evidence in the form of Audited Balance Sheet and Profit & Loss Account for the preceding 03 (three) financial/accounting years should be submitted along with the technical bid. Considering the time required for preparation of Financial Statements, if the last date of preceding financial / accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial / accounting year are not available with the bidder, then the financial turnover of the previous three financial / accounting	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	years excluding the preceding financial / accounting year will be considered. In such cases, the Net worth of the previous financial / accounting year excluding the preceding financial / accounting year will be considered. However, the bidder has to submit an affidavit/undertaking certifying that 'the balance sheet/Financial Statements for the financial year ..... (as the case may be) has actually not been audited so far'.	
18	In case the Bidder is subsidiary company (should be a wholly owned subsidiary of the parent/ultimate parent/holding company) who does not meet financial criteria by itself and submits his bid based on the strength of his parent/ultimate parent/holding company, then following documents need to be submitted. i) Turnover of the parent/ultimate parent/holding company should be in line with Para 1.0 above. ii) Net Worth of the parent/ultimate parent/holding company should be in line with para 2.0 above. iii) Corporate Guarantee on parent/ultimate parent/holding company's company letter head signed by an authorised official undertaking that they would financially support their wholly owned subsidiary company for executing the project/job in case the same is awarded to them. iv) Document of subsidiary company towards wholly owned subsidiary of the parent/ultimate parent/holding company	
19	Working Capital: i. The bidder should have minimum working capital equal to INR 50.1 Crore, as per immediate proceeding audited financial year result. In case the working capital is short the bidder can supplement the same through line of credit from a scheduled commercial bank having net worth more than 100 Crores as per enclosed format. ii. In the event of award, the contractor shall open a project specific account in a nationalized bank located in the vicinity where the project is executed. The contractor shall deposit an amount equal to 10% of the annualized contract value within 15 days from the date of issue of LOA. All payment against the contract shall be remitted to the project specific account. Any withdrawal from this account shall be only after the first payment against the contract is made by OIL. iii. At any point of time the minimum balance after first remittance by OIL against invoice from the contractor shall remain 5% of the annualized contract value. iv. In addition to above the bidder should submit a financial resource/cash flow plan for execution of this contract. v. Working Capital shall mean "Current Assets minus Current liabilities" as per latest year's audited consolidated annual	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	Financial Statements.	
20	Bid Capacity: The bidding capacity of the contractor should be equal to or more than the INR 334 Cr. The bidding capacity shall be worked out by the following formula: Bidding Capacity = [A x 1.5] - B Where, A = Maximum annual turnover in any one of the preceding three financial years B = Commitments in next twelve months from the date of expiry of the bid Validity as per BRS 30.	
C. COMMERCIAL CRITERIA		
21	Bids shall be submitted under single stage two bid system i.e., Technical Bid and Priced Bid separately. Bids shall be rejected outright if the prices are indicated in the technical bids or if not conforming to this two bid system.	
22	Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.	
23	Bids should be valid for minimum 270 days from the original bid closing date. Bids with shorter validity shall be rejected as being non-responsive.	
24	Bid Security in Original (valuing INR 2,75,00,000.00 and valid for 300 days from the original bid closing date) shall be furnished as a part of the Technical Bid and shall reach OIL's office at Jodhpur before bid closing date & time. A scanned copy of the bid security shall however be uploaded in OIL's E-Procurement portal along with the Technical Bid. The amount of Bid Security shall be as specified in the Forwarding Letter of the Bid Document. Bid without proper & valid Bid Security shall be rejected. Bid security can also be submitted through OIL's e-tender portal. Bid security amount can also be transferred through online transfer to the designated bank account of OIL, Rajasthan Fields after obtaining necessary clearance from the tendering authority of OIL at Jodhpur, Rajasthan. Bids received without bid security or with bid security with lesser value or validity shall be rejected straightaway.	
25	The Integrity Pact must be uploaded in OIL's E-Procurement portal along with the Technical Bid duly signed by the same signatory who signed the Bid i.e. who is duly authorized to sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit the Integrity Pact, their bid shall be rejected straightway.	
26	Performance security is applicable against this tender. Bidder to refer the related clause for Performance Security under "Instructions to Bidders" and confirm their unconditional compliance to the same. Bids failing to comply to the aforesaid clause shall be considered non-responsive and rejected straightaway.	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
27	Bids received through the e-procurement portal shall only be accepted. Bids received in any other from shall not be accepted.	
28	Bids submitted after the Bid Closing Date and Time shall be rejected.	
29	The bid documents are not transferable. Bids made by bidders who have not been issued the Bid documents from the Company shall be rejected.	
30	Bids shall be typed or written in indelible ink and shall be digitally signed by the bidder or his authorized representative.	
31	Bids shall contain no interlineations, erasures or over writing except as necessary to correct errors made by bidders, in which case such corrections shall be initialed by the person(s) signing the Bid.	
32	Bidders shall bear, within the quoted rates, the personal tax as applicable in respect of their personnel and Sub-Contractor's personnel, arising out of execution of the contract.	
33	Bidders shall bear, within the quoted rate, the corporate tax as applicable on the income from the contract	
34	Bidders shall quote their price exclusive of GST. The GST amount on the taxable part of the goods/services provided by the Contractor shall be paid by the Company as per provisions of the GST Act.	
35	Any Bid containing false statement shall be rejected.	
36	Bidders must quote clearly and strictly in accordance with the price schedule outlined in "Price Bid Format" of Bid Document; otherwise the Bid will be summarily rejected.	
37	Bidder must accept and comply with the following clauses as given in the Bid Document in to failing which bid will be rejected – i) Performance Guarantee Clause ii) Force Majeure Clause iii) Tax Liabilities Clause iv) Arbitration Clause v) Acceptance of Jurisdiction and Applicable Law vi) Liquidated damage and penalty clause vii) Safety & Labor Law viii) Termination Clause ix) Integrity Pact x) Withholding Clause	
38	Indian Bidders, whose proposal for technical collaboration/joint venture involves foreign equity participation or payment of royalty and/or lump sum for technical know- how and wherever Govt. approval is necessary, are required to submit copy of Govt. approval on their application prior to date of price-bid opening.	
D. GENERAL		
40	The “Statement of Compliance (Annexure-XV)” should be digitally signed and uploaded along with the Technical Bid (un-priced). In case bidder takes exception to any clause of Tender Document not covered under BEC, then the Company has the discretion to load or reject the offer on account of such exception if the Bidder does	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	not withdraw/modify the deviation when/as advised by the Company. The loading so done by the Company will be final and binding on the Bidders.	
41	To ascertain the substantial responsiveness of the Bid the Company reserves the right to ask the Bidder for clarification in respect of clauses covered under BEC also and such clarifications fulfilling the BEC clauses in totality must be received on or before the deadline given by the Company, failing which the offer will be summarily rejected.	
42	3.0 Any exception or deviation to the Tender requirements must be tabulated in the ANNEXURE-XV for Exception/Deviation provided in the tender document, by the Bidder, in their Technical Bid only. Any additional information, terms or conditions included in the Commercial (Priced) Bid will not be considered by OIL for evaluation of the Tender.	
43	The Company reserves the right to cancel/withdraw the tender or annul the bidding process at any time prior to award of contract, without thereby incurring any liability to the bidders or any obligation to inform the bidders of the grounds of Company's action.	
44	If any clauses in the BEC contradict clauses elsewhere in the Bid Document, then the clauses in the BEC shall prevail.	
E.	**DOCUMENTS ALONG WITH BID**	
45	Bidders must furnish documentary evidences in support of fulfilling the entire above requirement as under: a) P.O/Work Order and job Completion Certificate or any other documents from their clients which can substantiate their claim towards experience. b) Company Profile, address, concerned person and his/her contact details, organizational set up with details of professional technical and financial capabilities. c) Documents in the form of copies of relevant pages of Contract and Completion Certificate or final bill payment documents etc. or any other documents issued by their clients in support of executing the job as mentioned in the Scope of Work/Terms of Reference/Technical Specification of the bidding document, during last 7 years prior to the bid closing date of the tender. d) Bidder will have to submit Project Execution & Management / Planning & Scheduling methodology for the project. e) Proposed Overall Project Schedule (from the date of LOA till final commissioning and handover in line with project duration specified in the tender) in network form showing all the details. f) Organizational set up for Planning, Scheduling, Procurement & Project Management, Construction Management, Quality Management, Inspection & Expediting and Monitoring & Control at LSTK Contractor's Design Office and Site Office. g) Resource Deployment plan to meet the project plan as per schedule. h) Software's to be used by bidder for planning and material	

Sl. No.	DESCRIPTION	BIDDER'S CONFIRMATION
	control with licence details.\ i) Health, Safety and Environment (HSE) policies, implementation procedures in line with internationally accepted practices and statistics covering the last five (5) years. j) LTIFR track record for last three (3) years. k) List of policies, procedures and quality assurance & quality control practices currently in place for execution of similar work.	

Signature of Bidder

Bid Response Sheet No 7

PROFORMA FOR FURNISHING DETAILS OF PAST EXPERIENCE IN WIND/& SOLAR ENERGY PROJECTS DURING LAST THREE YEARS (TURNKEY PROJECT)
(Separate for wind and solar)

a) Total Aggregate capacity of all wind and solar farms executed on turnkey basis in India in the last three years in MW

Attach separate sheet for each wind and solar farm (at least for three projects)

Sl. No.	Description	
1	Name of works & Owner's address, contact person with telephone numbers.	
2	Detailed scope of work.	
3	Type of plant & machines used (only for major components).	
4	Capacity of the plant, No. of WEGs/solar module rating with capacity and height of tower as applicable.	
5	Whether O&M is being looked after? Please indicate period of O&M contract.	
6	Commissioning time as per contract.	
7	Actual commissioning time.	
8	If delayed, then reasons for delay.	
9	Period of successful operation.	
10	Actual generation achieved per machine per year (month-wise) since date of commissioning.	
11	Compensation on account of low Machine availability, if any	
12	Additional information, if any.	

b) O&M works of wind energy projects undertaken in India for total capacity

c) O&M contract for last three years in hand indicating capacity thereof.

d) Number of machines of quoted model in operation in India with no. of years in operation.

e) Number of WEGs/ solar project commissioned in current financial year up to date of submission of offer in India & in offered state.

Signature of Bidder

Bid Response Sheet No 8

LIST OF WEGs INSTALLED THRU TURNKEY PROJECTS (1500KW & ABOVE) & (15 MW SOLAR SYSTEM) IN INDIA
DURING PRECEDING THREE YEARS FROM DUE DATE OF OPENING OF OFFERS
AT LEAST 30 WEGS/30 MW
(a) WIND

Date of Commissioning of WEGs	Rating of WEG (kW)	No. of WEGs	Site(s) Details	Address & contact number of Investor

(b) SOLAR

Date of Commissioning of project	Rating of module (Wp)	No. of Solar modules	Site(s) Details	Address & contact number of Investor

Signature of Bidder

For Wind Bid Response Sheet No 9

WORK SHEET FOR ESTIMATED ANNUAL ENERGY PRODUCTION (TO BE QUOTED FOR EACH MODEL SEPARATELY)

Bidder shall furnish calculations for estimated Annual Energy Production (AEP) of the wind farm based on actual micrositing of WEGs for each site(s). Procedure followed viz. WAsP/PARK method or any other method and factors considered for calculating AEP shall be detailed in the offer.

The bidder shall furnish the following in soft copy:

1. MAP file containing orography / contour and roughness of the site(s) and surrounding area in digitized form.

6. Input wind data file for WAsP / PARK in the form TAB file.
7. WTG file duly corrected at site air density for WAsP input.
8. Raw wind data in excel format.
9. Total capacity of the wind farm planned at site.
10. All the coordinates (in UTM format) of the wind farm including coordinates of existing WEGs & proposed in future at offered site.
11. Coordinates (in UTM format) of all the existing WEGs of other developer(s).
12. Micro siting drawing of the wind Farm indicating all the WEGs.
13. Actual energy generation of the WEGs already existing in offered area or nearby area from the date of commissioning.
14. Distance of the reference met mast from the nearest & farthest offered WEG location.
15. Chart showing Yearly & Monthly Wind Variation.
16. Detailed Methodology used in arriving Annual Energy Production at P (90) along with detailed wind resource assessment report of Wind Farm.
17. Certified Power Curve of the offered WEG model.
18. Site(s) Air Density and corrected certified power curve at site(s) air density.
19. Power Law Index (PLI).

Time series Wind Data (speed & direction) or Directional Frequency Distribution Data in the following table:

TABLE – I

Class Interval m/s)	Mid Wind Speed (m/s)	Frequency percent (%)	Total hours (%)

Details of Reference Met Mast of NIWE near each of offered site(s) be furnished

Obtaining correct site(s) information with relevant details for working out AEP shall be the responsibility of the bidder.
Following information which has direct bearing on working out AEP should be furnished:

1)	Correction Factor for Air Density, %	:	
2)	Array Efficiency, %	:	
3)	Modeling Error, %	:	
4)	Machine Availability (Not less than 95%)	:	
5)	Any other factor	:	
6)	Annual Energy Production per WEG at controller after applying correction factors	:	
7)	Grid System availability, %	:	
8)	Guaranteed Evacuation Losses, % (supported by calculation sheet)	:	
9)	Estimated Saleable Energy at metering point	:	
10)	Feed in Tariff of the state along with copy of the SERC order	:	

Note: Above information be furnished separately for each option.

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Signature of Bidder

For solar Bid Response Sheet No 10

Net Electrical Energy Generation Guarantee (NEEGG) for 25 Years Period

1. The Bidder shall provide NEEGG/AEP, based on the Performance Ratio considering offered design configuration and all local conditions, solar insolation, wind speed and direction, air temperature & relative humidity, barometric pressure, rainfall, sunshine duration, grid availability and grid related all other factors and losses due to near shading, incidence angle modifier, irradiance level, temperature loss array loss, Module quality loss, Module array mismatch loss, and various inverter losses, etc. To assess/verify feasibility of quoted AEP/NEEGG, bidders are required to provide computation documents along with considered factors based on which AEP/NEEGG has been computed.
2. Bidder shall furnish detailed calculations for estimated Annual Energy Production (AEP) FOR 25 YEARS PERIOD of the 14 MW solar power plant based on solar irradiation

Sl. No.	Year	Net Electrical Energy Generation Guarantee (KWh)	PR Ratio (%)	Annual Degradation (%)
		(A)	(B)	(C)
1	1st			
2	2nd			
3	3rd			
4	4th			
5	5th			
6	6th			
7	7th			
8	8th			
9	9th			
10	10th			
11	11th			
12	12th			
13	13th			
14	14th			

15	15th			
16	16th			
17	17th			
18	18th			
19	19th			
20	20th			
21	21th			
22	22th			
23	23th			
24	24th			
25	25th			
	TOTAL			

Bid Response Sheet No.11

GUARANTEED POWER CURVE OF WEG OFFERED

Wind Speed (m/s)	Power (kW)	Thrust Coefficient (C_t)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

Air Density ……..

Reference of Certified Power Curve be given and a copy thereof furnished.

Signature of Bidder

For Wind Bid Response Sheet No.12

TECHNICAL PARTICULARS OF QUOTED MODEL OF WEG

General Data		
1	Make of WEG	
2	Type	
3	Rated output	
4	Current (Amps.)	
5	Voltage (V)	
6	Voltage Variation (%)	
7	Frequency Variation (%)	
8 a	Maximum Asymmetric Voltage (%)	
8b	Maximum Asymmetric Current (%)	
9	Wind Speed at rated output (m/ Sec)	
10	Cut in wind speed (m/sec)	
11	Cutout wind speed (m/sec)	
12	Tip speed (m/sec)	
13	Survival wind speed (m/sec)	
14	Hub height (m)	
15	Rotor speed (rpm)	
16	Nacelle tilt angle	
17	Regulation	
18	Designed max. temp. (deg. C)	
19	Designed life (years)	
20	Designed turbulence intensity	
21	Noise level (dB) (also specify distance)	
22	Frequency (Hz)	
23	Maximum designed rotor speed	
24	Pitch angle for stall regulated machine	
25	Rotor orientation (upwind /down wind)	
26	No. of blades	
27	Rotor diameter (m)	

Bid Response Sheet No.12 contd...

Weight		
1	Rotor (kg)	
2	Nacelle (kg)	
3	Tower (kg)	
4	Total (kg)	

Generator		
1	Make	
2	Rated power output (kW)	
3	Type – Synchronous/asynchronous	
4	Output Voltage and RPM	
5	No. of poles	
6	Insulation Class	
7	Protection class	
8	Coupling	
9	Current in Amps.	
10	Frequency	
11	Dual speed/Variable speed	
12	Type of cooling	
13	If forced cooling, then	
	a) a) Type & quantity of coolant	
	b) Pump rating	
	c) Motor make & rating	
	d) No. of phase	
	e) Motor duty cycle	
14	KVAr consumption of generator at :	
	- No Load	
	- 25% Load	
	- 50% Load	
	- 75% Load	
	- 100% Load	

Bid Response Sheet No.12 contd...

Rotor		
1	Blade material	
2	Make	
3	Number of blades	
4	Rotor diameter (m)	
5	Swept area(Sq. m)	
6	Length of blade(m)	
7	NACA Specification	
8	Blades profile	
9	Weight of each blade	
10	Reference Standards	
11	Lightning protection for blades	

Tower		
1	Height (m)	
2	Type	
3	Material	
4	No. of Sections	
5	Mode of Assembly	
6	Ladder type	
7	Safety system	
8	Surface treatment protection	
9	No. & type of landing platforms	
10	Make	
11	Type of reptile protection	

Yawing System		
1	Make & Type	
2	Gear Ratio	
3	Rated capacity of yaw motor (kW)	
4	No. of yaw motors	
5	Type of yaw brake	
6	No. of yaw brakes	

Bid Response Sheet No.12 contd...

Brake System		
1	Aero Dynamic	
	i) Type	
	ii) Control	
2	Mechanical or other type	
	i) Make & Type	
	ii) Position	
	iii) No. of calipers	
	iv) Motor capacity (kW)	

Gear Box (If required for the system)		
1	Type / model	
2	Gear ratio	
3	No. of steps	
4	Max. power transmission (kw)	
5	Lubricants	
6	Designed life	
7	Make	
8	Type of oil cooling	
9	Weight without oil (kg)	
10	Quantity of oil	

Hub		
1	Make & Type	
2	Material	

Main Shaft		
1	Make & Type	
2	Material	

Main Bearing		
1	Make	
2	Type & specification	

Coupling		
1	Make	
2	Type & specification	

Bid Response Sheet No.12 contd…

Nacelle		
1	Material	
2	Type of nacelle bed	
3	Facility of loading & unloading	
4	Lightning protection	

Reactive Power Compensation		
(required for WEGs with asynchronous generators)		
1	Capacity (KVAR)	
2	Number of capacitor units	
3	No. of steps	
4	Designed life of capacitors	
5	Type	
6	Make	
7	Current in Amps.	
8	Estimated kVArh consumption as percentage of annual kWh generation	
9	Power factor at : loads after compensation :	
	- No load	
	- 25% load	
	- 50% load	
	- 75% load	
	- 100% load	

Power Panel		
1	Voltage	
2	Short circuit level	
3	Rating of main MCCB	
4	Provision for earth fault protection	
5	Dimension	
6	Relevant standards	

Bid Response Sheet No.12 contd…

Control System		
1	Type	
2	List of display (please attach separate sheet)	
3	List of error messages (please attach separate sheet)	
4	List of annunciation (please attach separate sheet)	
5	Stop features	
6	Remote control facility	
7	Printer facility	
8..	Details of special accessories (Like Lap-top computer) for retrieval of parameters including power curve data.	
Details of AC-DC- AC Converters/ Inverter system		
(for variable speed WEGs)		

Sensors		
	List of sensors(please attach separate sheet)	

Details of CMCS		
Power cable (between generator & power panel)		
1	Type & Make	
2	Conductor material	
3	Conductor size	
4	No of core	
5	Ref. standard	

ISO 9000 Certification		
1	Category of certification	
2	Date of certification	

Signature of Bidder

For Wind Bid Response Sheet No.13

TECHNICAL PARTICULARS OF QUOTED SOLAR PV MODULE FOR 14 MW SOLAR POWER PLANT

Technology offered: Crystalline
Details of offered crystalline PV Modules

S. N.	Particulars	Offered
1.	PV Module Manufacture name & Country	
2.	PV Module type	
3.	Product Code	
4	No. of PV cells per Module	
5.	Solar Module frame material	
6.	Module dimensions	
7.	Output Cables	
8.	Junction Box	
9.	Construction Front Back	
10.	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	
11.	Nominal voltage	
12.	Nominal Wattage	
13.	Power Tolerance	
14.	Peak power voltage (Vmp)	
15.	Peak power current (Imp)	
16.	Open circuit voltage (Voc)	
17.	Short circuit current (Isc)	
18.	Weight of each module (Kg)	
19.	Fill Factor	
20.	Standards/Approvals from International Agencies	
21.	Module is suitable to operate at 50^{0} ambient	
22	Cell efficiency	
23	Module efficiency	
24	Temp cycling range	

25	Maximum System Voltage 600/1000V	
26	Temp coefficient of Isc	
27	Temp coefficient of Voc	
28	Temp coefficient of power	

Signature of the Bidder

Bid Response Sheet No.14

TECHNICAL DATA FOR TRANSFORMER
(To be submitted for each category of Transformer separately)

Sl. No	Description	Unit	Specification
1.	Service	Outdoor / indoor	
2.	Type	Outdoor / indoor	
3.	Rating	kVA	
4.	Rated frequency	Hz	
5	Number of phases:		
	HV	No	
	LV	No	
	Neutral (separate outside)	No	
6.	Rated Voltage		
	a) HV winding	kV	
	b) LV winding	kV	
7.	Vector group	Star / Delta	
8.	Type of cooling	ONAN/ ONAF	
9.	Insulation level:		
	a) Power frequency withstands (HV/LV)	kV rms	
	b) Impulse withstand voltage (HV/LV)	kV	
	c) Power frequency withstands (neutral)	kV rms	
10.	Method of earthing		
11.	Duty		
12.	Short circuit level	kA	
13.	Off circuit tap changer:		
	a) Range	%	
	b) In steps of		
	c) Tapping provided on HV side		
14.	Tap changer type		
15.	Temperature rise above 40^0 C ambient:		
	a) Top of oil by thermometer	^{0}C	
	b) Winding by resistance	^{0}C	
16.	Terminal details:		
	a) HV side		

	b) LV side		
17.	Losses (at 75^0C and principal tapping):		
	a) No load loss at rated voltage and frequency	kW	
	b) Load loss at rated current (ONAN)	kW	
	c) Total loss maximum rated power	kW	
18.	Efficiency at 75 ^{0}C and 0.9 PF:		
	a) At full load (ONAN)	%	
	b) At 75% load (ONAN)	%	
	c) At 50% load (ONAN)	%	
19.	Hot spot temperature in winding limit to	^{0}C	
20.	Shipping dimensions:		
	a) Height	mm	
	b) Breadth	mm	
	c) Length	mm	
21.	Painting		
22.	Reference standards		
23.	Make		
24.	Minimum creep age distance	mm/kV	
25.	Overall dimensions (L x B x H)	mm	
26.	% Impedance (±10% Tolerance)	%	
27.	Quantity of Oil	liters	
28.	Details of Instruments and protection provided with the Transformer(Make & Type)		

Signature of Bidder

Bid Response Sheet No 15

TECHNICAL PARTICULAR FOR INVERTER

Details	Offered
Make	
Nominal Output AC voltage	
Output Frequency	
Continuous Rating	
AC over / under voltage over / under frequency protection	
Total Harmonic Distortion	
DC Side	
Continuous Rating	
Maximum DC voltage Range	
MPPT range	
Control Type	
Waveform	
Parallel Operation Power Control	
THD	
Efficiency	
Internal Protection System (using electronic detection)	
Alarm Signals	
Front Panel Display(LCD)	
Front Panel Controls (via keypad)	
Front Panel Indicators	
RFI	
Circuit Breakers	
Earthing Provisions	
ENVIRONMENTAL Operating Temperature Range Humidity Enclosure	
Parameters Dimensions Weight	

DATA LOGGING Communication Interface	
System Features	
Logging Attributes	

Signature of the Bidder

Bid Response Sheet No.16

TECHNICAL PARTICULARS OF VCB

Sl. No.	Particulars	Specification
1.	Service	Outdoor/Indoor
2.	Make & Type	
3.	Rating	
4.	Circuit breaking capacity (KA)	
5.	Short circuit withstand capacity	
6.	Operating time	
7.	Wt. of V.C.B.	
8.	Insulation level	
9.	Impulse withstand voltage	
10.	Overall dimension	

Note: Bidder is required to submit single line diagram of the whole wind farm from WEG up to grid sub-station.

Signature of Bidder

For Wind Bid Response Sheet No.17

SOURCE OF COMPONENTS

Sl. No.	Item Description	Vendor	Type offered	Source country
1	Generator			
2	Blade			
3	Hub			
4	Tower			
5	Yawing System			
6	Brake calipers			
7	Hydraulic Disc brake system			
8	Main Shaft			
9	Main Bearing			
10	Local control system			
11	Gear Box			
12	Distribution transformer			
13	Horn Gap fuse			
14	Lightening Arrestor			
15	Interconnecting cable from WEG to Transformer			
16	AB Switch			
17	33 kV Vacuum /SF6 Circuit breaker			
18	Flexible coupling			
19	Power Panel			
20	Control Panel			
21	Capacitors			
23	CMCS			
24	AC-DC-AC converter/ inverter for variable speed			
25	Flexible cables			
26	PVC cable			
27	Contactors			
28	MCCBs			
29	Sensors(furnish information for all type of sensors)			
30	Gear Oil			

Signature of Bidder

For Solar Bid Response Sheet No.18

SOURCE OF COMPONENTS

Sl. No.	Item Description	Vendor	Type offered	Source country
1	Solar Modules			
2	Module mounting Structure			
3	String combiner box or Array Junction Boxes			
4	Invertors			
5	Inverter Transformer and Auxiliary Transformer			
6	HT Switchgear			
7	LT Switchgear			
8	DC cables			
9	AC cables			
10	Communication cable			
11	Auxiliary Supply System			
12	SCADA			
13	Weather monitoring system			
14	CCTV Camera			
15	Fire alarm System			
16	DC Distribution Board			
17	A C Distribution Board			
18	Plant Monitoring Desk			
19	Isolation Transformers			
20	Lighting			
21	Outgoing Feeder Cable			
22	Lightning and Over Voltage Protection			

Signature of Bidder

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Bid Response Sheet No.19

Details of Power Evacuation

S.No.	Item	Supporting Document Page No.
1	Furnish allocation letter confirming reservation of adequate power evacuation capacity for the project	
2	Furnish all relevant technical details like single line diagram of the proposed system indicating voltage & length of line, conductor size, capacity of proposed equipment / sub-station and line etc. along with its technical specification of general nature.	
3	Furnish detailed calculations for losses in Transformer(s), HT Line, EHV Line etc up to the point of interconnection including import of energy & auxiliary consumption	
4	In case power evacuation approval is in the name other than bidder please indicate details of such company & its relation with bidder .	
5	Provide detail of existing as well as proposed ISTS / InSTS substation with indicative information on total installed transformation capacity and capacity available in MVA which can be injected,. evacuated from the substation at particular time	

Signature of the Bidder

For wind Bid Response Sheet No.20 (a)

DRAFT ACTIVITY CHART

(to be submitted for each site(s))

Bidder shall furnish Bar Chart for the following activities and his plan to for implementation of the project to meet the commissioning date. This information shall be in addition to detailed project schedule and other information he is required to furnish as part of his offer. The activities indicated herein are minimum activities for which bidder shall furnish the required information. Bidders are encouraged to furnish more detailed information in their offer.

Sl. No.	Activity
1	Land acquisition and transfer to Owner
2	Sanctions/Approvals/Clearances
a.	Application/NOC from State Nodal Agency/State Govt.
b.	Power Purchase Agreement with Power Utility
c.	Approval from Chief Electrical inspector of State Govt.
d.	Clearance from Aviation Department, if applicable
e.	Clearance from Defense, if applicable
g.	Any other
3	Micrositing
4	Approach Road
5	Internal Road
6	WEG Tower Foundations
7	Control Cabins (in case of lattice Towers)
8	Office cum Control Room Building
9	Storage Shed
10	Permanent Water Supply
11	Supply of Equipment and Materials
a.	Towers for WEGs
b.	Nacelle for WEGs
c.	Blades for WEGs
d.	Control panels, Power Panels, Cables and Balance items of WEGs
e.	Equipment and Materials for Unit Sub-Stations
f.	Equipment and Materials for Internal OH Lines
g.	Equipment and Materials for common Sub-Stations/Metering Stations
h.	Equipment and Materials for External OH Lines
i.	Equipment and Materials for Modification at Grid Sub-Stations of Transmission Corporation Ltd./ Concerned DISCOM.
j.	Wind Mast and Data logger
k.	Central Monitoring and Control System

Sl. No.	Activity
12	Erection of Equipment and Materials
a.	Towers for WEGs
b.	Nacelle for WEGs
c.	Blades for WEGs
d.	Control panels, Power Panels, Cables and Balance items of WEGs
e.	Unit Sub-Stations
f.	Internal OH Lines
g.	Common Sub-Stations/Metering Stations
h.	External OH Lines
i.	Modification at Grid Sub-Stations of TRANSCO /DISCOM
j.	Wind Mast and Data logger
k.	Central Monitoring and Control System
13	Grid Interconnection of the wind farm
14	Commissioning of the wind farm
15	Training of OWNER Engineers
16	Handing over to OWNER

Note: Above information be furnished separately for each option.

Signature of the Bidder

For solar Bid Response Sheet No.20 (b)

DRAFT ACTIVITY CHART

Bidder shall furnish Bar Chart for the following activities and his plan to for implementation of the project to meet the commissioning date. This information shall be in addition to detailed project schedule and other information he is required to furnish as part of his offer. The activities indicated herein are minimum activities for which bidder shall furnish the required information. Bidders are encouraged to furnish more detailed information in their offer.

Sl. No.	Activity
1	Site grading, levelling, clearing of vegetation
2	Design of structures, foundation, control room and other associated buildings boundary wall ,security hut ,overall plant design and drawings , submission to OIL and arranging approval from OIL
3	Construction of Approach Road & Internal Road, foundations of module structures, transformers, Inverter , construction of control Room Extension of Domestic substation and various buildings , Water storage Tank etc.
4	Clearance from Aviation Department, if applicable
5	Clearance from Defense, if applicable
6	Any other clearance as required
7	Supply of modules , mounting structures, Inverters associated DC Equipment and Materials
8	Supply of balance materials& items of Solar Plant
9	Transformers , AC Distribution Board , D C distribution Board , 433 V XLPE Power cables, control cables , DC side Cables and Termination of line
10	Permanent Water Supply
11	Commissioning of Plant Erection of Modules, Mounting
12	Approval from Chief Electrical inspector of State Govt
13	Completion of plant in all respect
14	Central Monitoring and Control System SCADA

Signature of the Bidder

Bid Response Sheet No.21

To Methodology of various activities

Oil India Ltd;
2A District Shopping Center,
NH62, Saraswati Nagar,
Jodhpur, Rajasthan 342005

Sub: Bid No. ---------- Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project &14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

Dear Sir,

The methodology of various activities will be as under-

Sr. No	Item	Methodology
1	(i) Methodology of land transfer to Oil India (ii)Obtaining Non Agriculture use certificate wherever required	
2	Methodology of use of common path & ways	
3	Methodology of use of common power evacuation system	
4	Procedure/ Methodology for Power Purchase Agreement	
5	Any other Item	

Signature of Bidder

Bid Response Sheet No. 22

LIST OF COMPONENTS HAVING LIFE LESS THAN 20 YEARS
(To be filled for wind and solar separately)

Sl. No.	Description of Item	Make	Expected Life

Signature of the Bidder

For Wind Bid Response Sheet No. 23

DRAWINGS TO BE ENCLOSED BY THE BIDDER

The Bidder should enclose the following drawings with the bid:

i. Contour plan and layout of wind farm

ii. WEG Tower Foundation

iii. Single line schematic diagram of electrical system for grid interfacing and grid interconnection from WEG up to grid substation clearly indicating metering point with voltage and line lengths with type of conductor used.

iv. General drawings of electrical installations including unit substations control & metering station, EHV substations, overhead lines etc.

v. General arrangement drawings and circuit diagrams of major electrical equipment.

Signature of the Bidder

For solar Bid Response Sheet No. 24

DRAWINGS TO BE ENCLOSED BY THE BIDDER

The Bidder should enclose the following drawings with the bid:

i. Single line schematic diagram of electrical system for grid interfacing and grid interconnection from solar plant.
ii. General arrangement drawings and circuit diagrams of Module, Inverters, Transformers, and overall solar plant arrangement.
iii. Drawings of similar type of project already commissioned by bidder.

Signature of the Bidder

Bid Response Sheet No.25

DETAILS OF LAND FOR HYBRID ENERGY PROJECT

Sl. No.	Item	Particulars
1.	Nearest Village /Town	
2.	Location w.r.t. nearest village / town	
3.	Taluka /Tehsil	
4.	District	
5.	State	
6.	Nearest Railway station	
7.	Nearest Airport	
8.	Nearest Highway	
9.	Altitude of area	
10.	Approx. Land area (Ha) of the Wind farm.	
11.	Total Land area(Ha) to be transferred to OIL INDIA	
12.	Approx. Land area per WEG to be transferred to OIL INDIA and solar periphery	
13.	Whether land already been acquired or is in process of acquiring	
14.	Ownership Details (Also indicate basis of holding Ownership/lease/sub-lease)	
15.	Approach details	
16.	Estimated installed capacity considering WEG model	
17.	Nearest C Wet/MNRE Wind Monitoring Mast	
18.	Distance & direction from nearest C Wet / MNRE Wind Monitoring Mast	
19.	Details of Wind Monitoring Mast installed by the Bidder in this land (if any) i.e. height of mast, date of establishment of mast, date of closing of data collection (in case mast is already removed)	
20.	Whether sanction of project obtained or yet to be obtained.	

Note:

(1)The Bidder should give all relevant documents to satisfy OWNER regarding above information and attach extra sheets (if necessary).

(2) Above information be furnished separately for each option.

Signature of Bidder

Bid Response Sheet No. 26

DETAILS OF WIND DATA

Sl. No.	Item	Particulars
`A.	**Details of Wind Mast**	
1.	Whether Wind mast of C WET /Bidder's own	
2.	Source of wind data (Published or own data)	
3.	Distance & direction from the proposed site(s) (To mark on SOI map)	
4.	Height of wind mast	
5.	Make of data logger (in case of own mast)	
6.	Whether approved by MNRE/State Nodal Agency (in case of own mast)	
7.	Period of Wind data collection	
8.	Period of wind data used for annual energy production	
9.	Whether measurement has been carried out at two heights (If yes then indicate the heights)	
B.	**Details of wind data to be furnished along with the offer**	
1.	Annual frequency distribution in tabular form	
2.	Annual wind rose data in tabular form	
3.	Annual Average Air Density (mention source)	
4.	Annual average power law index (mention source)	

Note: Above information be furnished separately for each option.

Signature of Bidder

Bid Response Sheet No. 27

STATUTORY PERMISSION / CLEARANCE

Sl. No.	Clearance Detail	Status	Supporting Document page No.
1	Approval of State Nodal Agency		
2	Evacuation Clearance		
3	Grid connectivity approval		
4	Geology & Mining Clearance,		
5	Approval of MoEF		
6	Aviation clearances		
7	Air Force clearances		
8	Approval of CIEG		
9	Any Other clearance		

Note: Above information be furnished separately for each option

Bid Response Sheet No. 28

MANDATORY SPARES FOR WIND

SR. NO	Material Description	Quantity to be maintained (for each type and rating)
1	Accumulator	
2	Additional Load	
3	Air filter	
4	Anemometer	
5	Barrier	
6	Blade bearing grease	
7	Break pad	
8	Breaks	
9	Cable Ties	
10	Cable twist sensor	
11	Cables	
12	Carbon Brush	
13	Converter Communication cable	
14	Coolant	
15	Coupling	
16	CRC Gasket Remover	
17	CRC Letra clean spray	
18	DM water	
19	Earth brush	
20	Encoder	
21	Carbon brush	
22	FRP Paint	
23	Gear Box	
24	Gear box oil	
25	Gearbox breather	
26	Gearbox oil filter	
27	Generator	
28	Generator carbon brush (slipping brush)	
29	Generator DE and NDE bearing	
30	Generator Grease	
31	Glycol	
32	Grease collector	
33	Grease gun	
34	Grease Gun (Both Electrical and Manual)	
35	Hydraulic oil	

SR. NO	Material Description	Quantity to be maintained (for each type and rating)
36	IGBT	
37	light (cell , nacelle, Panel)	
38	Lugs Allu./ Copper	
39	Main Bearing Grease	
40	OFC cable	
41	line filter with spring	
42	Panel cooling Fan	
43	Panel Filter	
44	Pen guard Express Comp A	
45	Petroleum jelly	
46	Power Carbon brush	
47	Radiator and Radiator motor	
48	Resolver	
49	Rotor Set (3 Blades)	
50	Rotor Brake pad	
51	Sealant for FRP Repairing	
52	Silica Gel	
53	SKF LW grease	
54	Solid state Really cover	
55	Solid state Really plate	
56	Solvent	
57	Suspension Type Insulator Dog	
58	Suspension Type Insulator Panther	
59	Tefflon Tape	
60	Timer Card of USS Yard Light	
61	Transformer Fan	
62	Wind vane	
63	Wind vane & Anemometer stand	
64	Yaw Caliper brake Pad	
65	Yaw Grease	
66	Yaw motors	
67	Zinc Spray	
68	Gearbox pump motor	
69	Nacelle fan	

Bid Response Sheet No. 29

MANDATORY SPARES FOR SOLAR

S. No.	Equipment/Material	Quantity to be maintained (for each type and rating)
1	PV Modules	
2	MC4 connectors (including Y-connector if used)	
3	String Monitoring Unit	
4	Power Conditioning Unit	
	(i) Central Inverter	
	(ii) String Inverter	
5	Inverter Transformer	
	(i) HV bushing with metal parts and gaskets	
	(ii) LV bushing with metal parts and gaskets	
	(iii) WTI with contacts	
	(iv) OTI with contacts	
	(v) Buchholz relay	
	(vi) Magnetic Oil Gauge	
	(vii) Complete set of gaskets	
6	HT Switchgear	
	(i) Vacuum pole	
	(ii) Closing coil	
	(iii) Tripping coil	
	(iv) Spring charging motor	
	(v) Relay	
	(vi) Meter	
	(vii) Current Transformer	
	(viii) MCCB	
	(ix) MCB	
	(x) Fuse	
	(xi) Indicating lamp	
	(xii) Rotary switch	
7	LT Switchgear	

S. No.	Equipment/Material	Quantity to be maintained (for each type and rating)
	(i) MCCB	
	(ii) MCB	
	(iii) Fuse	
	(iv) Relay	
	(v) Meter	
	(vi) Current Transformer	
	(vii) Voltage Transformer	
	(viii) Indicating lamp	
	(ix) Rotary switch	
8	Solar Cable	
9	DC Cable	
10	AC Cable	
11	Communication Cable	
12	Fuse	

Note: Spares, if used, during the O&M period shall be replenished by the Contractor. All the mandatory spares shall be handed over to the Employer in working condition at the end of O&M period

Bid Response Sheet No. 30

DECLARATION BY BIDDER REGARDING CONCURRENT COMMITMENT

1/We.....aged .....years son of ..... do hereby solemnly affirm and declare as follows for and on behalf of the Firm:					
LIST OF EXISTING COMMITMENT AND ONGOING WORKS					
Sr. No.	Name of Works	Client Name& Address	Work Order Value (TNR)	Work Executed till date of submission of bid (INR)	Amount of balance work which may fall for execution during the period of 12 months from the date of expiry of the bid validity (INR)
1	2	3	4	5	(4-5) 6
	Balance commitments in 12 month from the date of expiry of the bid				INR
	It is certified that the above particulars furnished are true and correct. If any information given is found to be misleading at a later date, OIL will have the authority to take necessary action as per provision of the Contract and as per laid down procedure of the Company (OIL).				
SIGN AND STAMP OF BIDDER (AUTHORISED SIGNATORY HAVING POWER OF ATTORNEY)					

Note: Accuracy level of balance commitments as per total of column 6 above should be within+/ 10%.

1. Debt equity ratio: Debt equity ratio of the bidder should not be more than 2:1.
2. Debt equity ratio shall mean long term borrowings/ Net worth.

Note: In case the financial statements submitted by the bidder are in currencies other than INR, BC selling rate declared by State Bank of India prevailing on one day prior to bid closing date shall be considered for converting it into I NR.

Bid Response Sheet No. P-I

Tender No. SJI3301P20

SCHEDULE OF PRICE–I (Wind)

Sl. No.	Particulars (Firm & Fixed)	Unit Price In INR
1	Design, engineering, manufacture, supply & delivery at site(s) of WEG consisting of nacelle assembly, generator, blades, tower etc; Central Monitoring and Control System (CMCS) on sharing basis, control panels, power & control cables, 33 kV sub-station including appropriate step-up transformer, VCB, CTs, PTs, C&R panels, DC system etc; micro-siting; carrying out required civil work; erection & commissioning of WEG; proportionate cost of internal 33 kV line; Common EHV sub-station with necessary equipment and materials, grid extension (i.e. external overhead line up to grid sub-station (termination end), bay extension or creation of additional facilities at grid substations) interfacing with grid sub-station; arranging transit insurance of all equipment; storage at site(s) and other auxiliaries till commissioning and take over, and all other works enabling wind power project work complete in all respects as per the scope of work inclusive of all types of taxes, duties, levies etc. and cost of land but excluding GST. GST as applicable shall be payable extra.	
2	Location Offered	
3	No. of WEGs	
4	Total Capacity in MW	
5	Total Price	

NOTE:

1. The Price should be written in both in words & figures. No correction in price should be done.
2. Any item of work not mentioned in the above particulars but written elsewhere in the scope of work or in Technical Specification or essentially required for completion of works, proper operation and maintenance of wind farm, safety of equipment and operating personnel shall be deemed to have been included in the above particulars.
3. The prices mentioned at this page shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids shall be ignored while evaluation the bids.
4. The prices quoted should be inclusive of all taxes, duties and levies but excluding GST. However, the break-up of taxes and other statutory levies other than GST included above should be indicated separately. Bidder to also furnish the applicable HSN/SAC code with reference to applicable GST rate for each item and service quoted by them.
5. Above information be furnished separately for each option.
6. Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.
7. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of Bidder

Bid Response Sheet No. P-II

Tender No. **SJI3301P20**

SCHEDULE OF PRICE–II (Wind)

Comprehensive charges of operation and maintenance of the wind farm facility project after the date of successful completion of warrantee period for 25 years including supply of spares, consumables, tools, tackles, crane arrangement, testing equipment and instruments, lease charges, man power including security personnel , insurance, fees/charges payable to Govt. agencies, liaison with all govt. agencies, payment of all charges / levies for consuming active and reactive power, all administrative work, maintaining records and submission to all concerned authorities. Year-wise price to be furnished.

A) Comprehensive Operation & Maintenance Charges: ***(In INR)***

Particulars	***No. of WEGs***	***Total O&M charges for WPP (inclusive of taxes & duties)***	
Year	Basic O&M charges / WEG (inclusive of taxes & Duties)	No. of WEG	*Total O&M charges*
A	B	C	D = (B x C)
1st			
2nd			
3rd			
4th			
5th			
6th			
7th			
8th			
9th			
10th			
11th			
12th			
13th			

14th			
15th			
16th			
17th			
18th			
19th			
20th			
21st			
22nd			
23rd			
24th			
25th			
TOTAL (in figures)			
TOTAL (in words)			

Bidder should quote the O & M charges for shared facilities as -- percentage (%) of the basic O & M charges as quoted in column “B” Above O&M charges should be firm and inclusive of all variation in taxes, duties, levies, wages, salaries etc. other than GST. GST will be payable extra by OIL as applicable.

B) <u>Statutory & Other Charges for Wind Power Project payable by Oil India:</u>

(In INR)

Particulars	***Statutory & other charges per annum for the wind farm***						***Annual S&F Charges for the wind farm ****
Year	***Lease Rental Charges***	***CEIG Charges***	***Meter calibration charges***	***DISCOM Charges***	***Any other charges, if any (1)***	***Total Statutory & other charges***	***Basic S&F Charges***
A	***B***	***C***	***D***	***E***	***F***	***G=Sum of B to F***	***H***
1st							
2nd							
3rd							
4th							
5th							
6th							
7th							
8th							
9th							
10th							
11th							
12th							
13th							
14th							
15th							
16th							
17th							
18th							

19th							
20th							
21st							
22nd							
23rd							
24th							
25th							
Total							

**** The S&F (Scheduling & Forecasting) charges shall be payable from the 1st year of comprehensive O&M. IN case the same is done by the utility or QCA these charges will not be paid to operator.***
Above O&M charges should be firm and inclusive of all variation in taxes, duties, levies, wages, salaries etc. other than GST. GST will be payable extra by OIL as applicable.

C) Grand Total of annual charges for WPP (inclusive of taxes & duties)

Year	***Total O&M charges for WPP (inclusive of taxes & duties but excluding GST)***	***Total Statutory & other charges***	***Total S&F charges (excluding GST)***	***Grand Total of annual charges for WPP (inclusive of taxes & duties but excluding GST)***
Ref.	*From Table A, Col. F*	*From Table B, Col. G*	*From Table B, Col. J*	
1	*2*	*3*	*4*	*5=(2+3+4)*
1st				
2nd				
3rd				
4th				
5th				
6th				
7th				
8th				
9th				
10th				
11th				
12th				
13th				
14th				
15th				
16th				
17th				
18th				
19th				
20th				

21st				
22nd				
23rd				
24th				
25th				
Total in figures				
Total in Words				

Note:

1. The Price should be written in both in words & figures. No correction in price should be done.
2. Any item of work not mentioned in the above particulars but written elsewhere in the scope of work or in Technical Specification or essentially required for completion of works, proper operation and maintenance of wind farm, safety of equipment and operating personnel shall be deemed to have been included in the above particulars.
3. The prices mentioned at this page shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids shall be ignored while evaluation the bids.
4. The prices quoted should be inclusive of all taxes, duties and levies but excluding GST. However, the break-up of taxes and other statutory levies other than GST included above should be indicated separately. Bidder to also furnish the applicable HSN/SAC code with reference to applicable GST rate for each item and service quoted by them.
5. Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.
6. Any incentive subsidy granted by Central/State Government shall be to the benefit of OIL INDIA's.
7. In column '4', S & F Charges are for providing the services of Scheduling and Forecasting for the wind farm.
8. Above information be furnished separately for each option.
9. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of Bidder

Bid Response Sheet No. P-III

Tender No. **SJI3301P20**

SCHEDULE OF PRICE–III
BREAK-UP OF PRICE FOR SUPPLY OF EQUIPMENT FOR CAPACITY OFFERED

Sl. No.	Item	Basic Price	Total
1	Supply of Wind Electric Generators complete in all respect (total cost) Break up price : a) Nacelle assembly b) Blades c) Tubular Tower d) Transformer		
2	Supply of Central Monitoring & Control System (CMCS) complete in all respect with necessary software, hardware, cables etc. including linking to Owner's office at Jodhpur and /or any other location on sharing basis.		
3	Supply of balance equipment, material and associated electrical work complete in all respects		
4.	Supply of equipment, and material for grid extension work which includes transmission line from wind farm to grid substation of State utility and augmentation of the utility sub-station		
5	Any other item not covered above (to be clearly specified by the Bidder)		
	Total		

Note:

1. The Price should be written in both in words & figures. No correction in price should be done.

2. Any item of work not mentioned in the above particulars but written elsewhere in the scope of work or in Technical Specification or essentially required for completion of works, proper operation and maintenance of wind farm, safety of equipment and operating personnel shall be deemed to have been included in the above particulars.
3. The prices mentioned at this page shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids shall be ignored while evaluation the bids.
4. The prices quoted should be inclusive of all taxes, duties and levies but excluding GST. However, the break-up of taxes and other statutory levies other than GST included above should be indicated separately. Bidder to also furnish the applicable HSN/SAC code with reference to applicable GST rate for each item and service quoted by them.
5. Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.
6. At the point of inter connection with State grid system, the work shall need to be carried out as per the approval of power utility and is included in the above price.
7. The work shall be carried out as per the I. E. Rules & Code of practice and prudent utility practices along with the approvals of statutory authority
8. The work of liaising with power utility for interconnection and its approval from them shall be the responsibility of the Contractor.
9. Providing of any / all items as required by the power utility for interconnection of wind farm with grid is deemed to be inclusive in above rates.
10. Details of proposed power evacuation, i.e. type of power line and substation, etc. proposed along with single line diagram should be provided with the Bid Response Sheet no. 16.
11. The total of the break-up price (PIII + PIV) should match with the lump sum total price quoted on turnkey basis in the price bid (Bid Response Sheet No. PI). In case of any discrepancy, the price quoted in the price bid (Bid Response Sheet No. PI) shall be considered final for evaluation of bids.
12. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of Bidder

Bid Response Sheet No. P-IV

Tender No. **SJI3301P20**

SCHEDULE OF PRICE–IV
BREAK-UP OF COST FOR CONSTRUCTION, ERECTION & COMMISSIONING FOR CAPACITY OFFERED

Sl. No.	ITEM	Basic Price	Total
1	Land development including facilitation charges towards procurement of land including cost of land		
2	Civil works within the wind farm complete in all respect		
3	Erection, Testing & Commissioning of Wind Electric Generators		
4	Erection, Testing & Commissioning of unit substation and shared internal lines for evacuation of power.		
5	Erection, Testing & Commissioning of external evacuation system and grid extension work including interconnection at State grid.		
6	Infrastructure development charges payable to government		
7	All fees/charges towards application, approval, clearances etc.		
	Total		

Note:- (1) The total of the break-up price (PIII + PIV) should match with the lump sum total price quoted on turnkey basis in the price bid (Bid Response Sheet No. PI). In case of any discrepancy, the price quoted in the price bid (Bid Response Sheet No. PI) shall be considered final for evaluation of bids. Any statutory changes in taxes and duties will be to OIL INDIA's account

(2) Above information be furnished separately for each option.

(3) During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of Bidder

Bid Response Sheet No. P- 1

Tender No.

SCHEDULE OF PRICE –1 (Solar)

Sl. No.	Particulars (Firm)	Price In INR
1	Design, engineering, manufacture, supply & delivery at site(s) of Solar plant consisting of PV modules, inverters, Supporting structure, etc.; Central Monitoring and Control System (CMCS), control panels, power & control cables, LT switch gear , transformers, DC system etc. carrying out required civil work; erection & commissioning of solar plant and associated line from solar plant to Pooling substation arranging transit insurance of all equipment; storage at site(s) and other auxiliaries till commissioning and take over, and all other works enabling Solar power project work complete in all respects as per the scope of work inclusive of all types of taxes, duties, levies etc. but exclusive of GST for 14 MW .	

NOTE:

1. The Price should be written in both in words & figures. No correction in price should be done.
2. Any item of work not mentioned in the above particulars but written elsewhere in the scope of work or in Technical Specification or essentially required for completion of works, proper operation and maintenance of wind farm, safety of equipment and operating personnel shall be deemed to have been included in the above particulars.
3. The prices mentioned at this page shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids shall be ignored while evaluation the bids.
4. The prices quoted should be inclusive of all taxes, duties and levies but excluding GST. However, the break-up of taxes and other statutory levies other than GST included above should be indicated separately. Bidder to also furnish the applicable HSN/SAC code with reference to applicable GST rate for each item and service quoted by them.
5. Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.
6. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of Bidder

Bid Response Sheet No. P-2

Tender No. SJI3301P20

SCHEDULE OF PRICE– 2 (Solar)

Comprehensive charges of operation and maintenance of the solar plant facility project after the date of successful completion.

A) Comprehensive Operation & Maintenance Charges: ***(In INR)***

Year	Basic Annual O&M Charges	O&M charges (inclusive of taxes & Duties but exclusive of GST)	*CEIG Charges*	*Any other charges, if any*	Total O&M Charges	S & F Charges Exclusive of GST	Total cost
A	B	C	D	E	F=C+D+E	G	H=F+G
1							
2							

TOTAL							
TOTAL IN WORDS							

Note:

1. The Price should be written in both in words & figures. No correction in price should be done.
2. Any item of work not mentioned in the above particulars but written elsewhere in the scope of work or in Technical Specification or essentially required for completion of works, proper operation and maintenance of wind farm, safety of equipment and operating personnel shall be deemed to have been included in the above particulars.
3. The prices mentioned at this page shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids shall be ignored while evaluation the bids.
4. The prices quoted should be inclusive of all taxes, duties and levies but excluding GST. However, the break-up of taxes and other statutory levies other than GST included above should be indicated separately. Bidder to also furnish the applicable HSN/SAC code with reference to applicable GST rate for each item and service quoted by them.
5. Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.
6. Any incentive subsidy granted by Central/State Government shall be to the benefit of OIL INDIA's.
7. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of Bidder

Bid Response Sheet No. P-3

Tender No. SJI3301P20

SCHEDULE OF PRICE– P-3

BREAK-UP OF PRICE FOR SUPPLY OF EQUIPMENT FOR CAPACITY OFFERED

Sl. No.	Item	Basic Price	Custom Duty / Excise Duty	Total
1	Supply of Solar power system complete in all respect (total cost) Break up price:			
	e) Module			
	f) Inverter			
	g) Structure			
	h) Transformer			
2	Supply of Central Monitoring & Control System (CMCS) complete in all respect with necessary software, hardware, cables etc.			
3	Supply of balance equipment, material and associated electrical work complete in all respects (Further Break up can be provided in attached sheet P-3 A, if required)			
4	Supply of equipment, and material for Domestic control room			
5	Any other item not covered above (to be clearly specified by the Bidder)			
	Total			

Note:

1. The Price should be written in both in words & figures. No correction in price should be done.
2. Any item of work not mentioned in the above particulars but written elsewhere in the scope of work or in Technical Specification or essentially required for completion of works, proper operation and maintenance of wind farm, safety of equipment and operating personnel shall be deemed to have been included in the above particulars.
3. The prices mentioned at this page shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids shall be ignored while evaluation the bids.
4. The prices quoted should be inclusive of all taxes, duties and levies but excluding GST. However, the break-up of taxes and other statutory levies other than GST included above should be indicated separately. Bidder to also furnish the applicable HSN/SAC code with reference to applicable GST rate for each item and service quoted by them.
5. Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and

not subject to variation on any account.

6. The work shall be carried out as per the I. E. Rules & Code of practice and prudent utility practices along with the approvals of statutory authority
7. Providing of any / all items as required by the power utility for interconnection of Solar Plant with grid is deemed to be inclusive in above rates.
8. The total of the break-up price (P3 + P4) should match with the lump sum total price quoted on turnkey basis in the price bid (Bid Response Sheet No. P1). In case of any discrepancy, the price quoted in the price bid (Bid Response Sheet No. P 1) shall be considered final for evaluation of bids.
9. Any statutory changes in taxes and duties will be to OIL INDIA's account.
10. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of the Bidder

Bid Response Sheet No. P- 3 A

Tender No. SJI3301P20

SCHEDULE OF PRICE–3 A

Break-Up of Price for Balance Of Equipments, Material And Associated Electrical Work Complete In All Respects For Capacity Offered (if required)

Sl. No.	Item	Basic Price	Custom Duty / Excise Duty	Total
i				
ii				
iii				
iv				
v				
vi				
vii				
viii				
ix				
x				
	Total			

Note:

1. The Price should be written in both in words & figures. No correction in price should be done.
2. Any item of work not mentioned in the above particulars but written elsewhere in the scope of work or in Technical Specification or essentially required for completion of works, proper operation and maintenance of wind farm, safety of equipment and operating personnel shall be deemed to have been included in the above particulars.
3. The prices mentioned at this page shall be taken into consideration for evaluation of bids. Any variation observed elsewhere in the bids shall be ignored while evaluation the bids.
4. The prices quoted should be inclusive of all taxes, duties and levies but excluding GST. However, the break-up of taxes and other statutory levies other than GST included above should be indicated separately. Bidder to also furnish the applicable HSN/SAC code with reference to applicable GST rate for each item and service quoted by them.

5. Bidder shall offer firm prices. Price quoted by the successful bidder must remain firm during the execution of the contract and not subject to variation on any account.
6. The work shall be carried out as per the I. E. Rules & Code of practice and prudent utility practices along with the approvals of statutory authority
7. Providing of any / all items as required by the power utility for interconnection of Solar Plant with grid is deemed to be inclusive in above rates.
8. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of the Bidder

Bid Response Sheet No. P-4

Tender No. SJI3301P20

SCHEDULE OF PRICE–4

BREAK-UP OF COST FOR CONSTRUCTION, ERECTION & COMMISSIONING FOR CAPACITY OFFERED

Sl. No.	ITEM	Basic Price	Total
1	Civil works within the Solar Plant complete in all respect		
2	Erection, Testing & Commissioning of Solar power project		
3	Erection, Testing & Commissioning of evacuation system and line extension work up to Pooling substation		
4	All fees/charges towards application, approval, clearances etc.		
5	Any other item		
	Total		

Note: - (1) The total of the break-up price (P3 + P4) should match with the lump sum total price quoted on turnkey basis in the price bid (Bid Response Sheet No. P 1). In case of any discrepancy, the price quoted in the price bid (Bid Response Sheet No. P 1) shall be considered final for evaluation of bids. Any statutory changes in taxes and duties will be to OIL INDIA's account. During currency of the Contract, any statutory changes in taxes and duties will be to OIL INDIA's account.

Signature of the Bidder

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VIII	Mandate form for electronic payment through internet & RBI
IX	Social Accountability 8000 Compliance Format
X	Bidder Information
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ANNEXURE- I

BID FORM

Oil India Ltd;
2A Saraswati Nagar
Jodhpur -342005

Sub: TENDER NO. SJI3301P20.

Gentlemen,

Having examined the General and Special Conditions of Contract and the Terms of Reference including all attachments thereto, the receipt of which is hereby duly acknowledged, we the undersigned offer to perform the services in conformity with the said conditions of Contract and Terms of Reference for the sum of _____ (Total Bid Amount in words and figures) or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, to commence the work within (_____) days calculated from the date of issue of Letter of Award (LOA).

If our Bid is accepted, we will obtain the guarantee of a bank in a sum not exceeding 10% of estimated Annual contract value for the due performance of the Contract.

We agree to abide by this Bid for a period of ___ days from the date fixed for Bid closing and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof in your notification of award shall constitute a binding Contract between us.

We understand that you are not bound to accept the lowest or any Bid you may receive.

Dated this _____ day of _____ 2019.

Authorised Person's Signature: _____

Name: _____

Designation:_____

Seal of the Bidder:

Annexure-II

FORM OF BID SECURITY (BANK GUARANTEE)

Ref. No. Bank Guarantee No.

TO
OIL INDIA LIMITED
For DGM-SERVICES
RAJASTHAN PROJECT
JODHPUR-342005

WHERAS, (Name of Bidder) …… (hereinafter called "the Bidder") has submitted their Bid No. ..... dated ……for the provision of certain OILFIELD services (hereinafter called "the Bid") against OIL INDIA LIMITED, RAJASTHAN PROJECT, JODHPUR (hereinafter called the "Company")'s IFB No….. KNOW ALL MEN by these presents that we (Name of Bank) …… of (Name of country) …… having our registered office at …… (hereinafter called "the Bank") are bound unto the Company in the sum of (……..)* for which payment well and truly to be made to Company, the Bank binds itself, its successors and assignees by these presents.

SEALED with the common seal of the said Bank this ……. Day of …… , 2016.

THE CONDITIONS of this obligation are:
1. If the Bidder withdraws their bid during the period of bid validity specified by the Bidder;
Or
2. If the Bidder, having been notified of the acceptance of their bid by the Company during the period of bid validity:
- fails or refuses to execute the Form of Contract in accordance with the
Instructions to Bidders in the tender documents, or
- fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders in the tender documents;
Or
3. If the Bidder furnishes fraudulent document/information in their bid

We undertake to pay to Company up to the above amount upon receipt of its first written demand (by way of letter/fax/cable/email), without Company having to substantiate its demand, provided that in its demand Company will note that the amount claimed by it is due to it owing to the occurrence of any of the conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including the date (**) and any demand in respect thereof should reach the bank not later than the above date.

SIGNATURE AND SEAL OF THE GUARANTOR……
Name of Bank & Address……
Witness ……..
Address……..

(Signature, Name and Address)
Date…….
Place…….

· The Bidder should insert the amount of the guarantee in words and figures denominated in the currency of the Company's country or an equivalent amount in a freely convertible

currency.
· The Date of Expiry of Bank Guarantee should be 210 days after the bid closing date as stated in the tender document

The details of the issuing bank and controlling bank are as under:

A. Issuing Bank
1. Full address of the bank:
2. Email address of the bankers:
3. Mobile nos. of the contact persons:

B. Controlling Office
1. Address of the controlling office of the BG issuing banks:
2. Name of the contact persons at the controlling office with their mobile nos. and email address:

Signature& Seal of the Bank

NOTE : Bidders are requested to advise the Bank Guarantee issuing bank to comply with the following and ensure to submit, the receipt of the copy of SFMS message as sent by the issuing bank branch, along with the original Bank Guarantee in OIL's tender issuing office / upload the same in OIL's e-tender portal along with the technical bid.

The bank guarantee issued by the bank must be routed through SFMS platform as per following details:

(a) "MT 760 / MT 760 COV for issuance of bank guarantee
(b) "MT 760 / MT 767 COV for amendment of bank guarantee

The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Jodhpur Branch, IFS Code - UTIB0000057; Swift Code: AXISINBB057. Branch Address - AXIS Bank Ltd, Prince Tower, Near Jaljog Circle, Residency Road, Jodhpur - 342003"

***

ANNEXURE-III

FORM OF PERFORMANCE BANK GUARANTEE (UNCONDITIONAL)*

To:
(Name of Company ……)
(Address of Company ……..)

WHEREAS (Name and address of Contractor) …… (hereinafter called "Contractor") had undertaken, in pursuance of Contract No……. Dated …… to execute (Name of Contract and brief description of the work) …… (hereinafter called "the Contract"), AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a bank guarantee by a recognised bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND

WHEREAS we have agreed to give the Contractor such a Bank Guarantee, now THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of (Amount of Guarantee)** …….. (in words) …… …….. such sum being payable in the type and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of the guarantee sum as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modifications of the terms of the Contract or of the work to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee is valid until the date (……)**(calculated at **3 months** after Contract completion date).

SIGNATURE & SEAL OF THE GUARANTOR :……
Name of Bank
:……
Address :……
……
Date :……

---

* Bidders are NOT required to complete this form while submitting the bid.

**An amount is to be inserted by the guarantor, representing the percentage of the Contract price specified in the Contract, and denominated either in the currency of the Contract or in a freely convertible currency acceptable to the Company as per para 29.0 of Part-1.

The details of the issuing bank and controlling bank are as under:

A. Issuing Bank
1. Full address of the bank:
2. Email address of the bankers:
3. Mobile nos. of the contact persons:

B. Controlling Office
1. Address of the controlling office of the BG issuing banks:
2. Name of the contact persons at the controlling office with their mobile nos. and email address:

Signature& Seal of the Bank

NOTE : Bidders are requested to advise the Bank Guarantee issuing bank to comply with the following and ensure to submit, the receipt of the copy of SFMS message as sent by the issuing bank branch, along with the original Bank Guarantee in OIL's tender/contract issuing office .

The bank guarantee issued by the bank must be routed through SFMS platform as per following details:

(a) "MT 760 / MT 760 COV for issuance of bank guarantee
(b) "MT 760 / MT 767 COV for amendment of bank guarantee

The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Jodhpur Branch, IFS Code - UTIB0000057; Swift Code: AXISINBB057. Branch Address - AXIS Bank Ltd, Prince Tower, Near Jaljog Circle, Residency Road, Jodhpur - 342003"

***

ANNEXURE- IV

Format for Queries

To
Oil India Ltd;
Plot No 19, Sector-16A,
NOIDA-201203

Sub: Tender No. :
Dear Sir,

Having examined the General and Special Conditions of Contract and the Terms of Reference including all attachments thereto, the receipt of which is hereby duly acknowledged, we have some queries and the same are submitted as per the format provided in the tender documents.

Sl. no	**Section Reference of the Tender document**	**Clause No. of the Section Reference of Tender document**	**Clause as given in the Tender document**	**Description of queries raised**	**Clarification / changes suggested /amendment**
1					
2					
3					

Signature
_____
(In the capacity of)

Annexure-V

Procedure for Performance Testing

Part A: Solar PV power plant Net power generation

1. The Contractor shall quote the 'Net Electrical Energy Generation Guarantee", "Performance Ratio" and Degradation for annual basis considering the Reference Global Average Radiation in BRS 10

2. The Contractor shall demonstrate "Actual Delivered Energy" at metering point (GETCO end sub-station) as compared to the '*NEEGG'* for first year from the date of starting of O&M Period.

3. The quoted NEEGG as in BRS 10 for any year shall be permitted with maximum 1 % degradation factor in previous year generation.

4. The quoted NEEGG will be used for the calculating CUF.

5. The Bidder shall clearly mention the technology used i.e. fixed/tilt or seasonal tracker (please specify) as offered.

Part B: Operational Acceptance Test Procedure

Performance Ratio (PR) - Test Procedure

1. Performance Ratio as determined through the PR Test Procedure specified here should not be less than as quoted in BRS 10.
2. The Performance Ratio Test to prove the guaranteed performance parameters of the power plant shall be conducted at site by the Contractor in presence of the Owner. The Contractor's Engineer shall make the plant ready to conduct such tests. The Operational Acceptance Test shall be commenced, within a period of one (1) month after successful Commissioning and, there will be continuous monitoring of the performance for 30 days. Any extension of time beyond the above one (1) month shall be mutually agreed upon. These tests shall be binding on both the parties to the Contract to determine compliance of the equipment with the guaranteed performance parameters. This monitoring will be performed on the site under the supervision of the Owner/ Owner's engineer.
3. The test will consist of guaranteeing the correct operation of the plant over 30 days, by the way of the efficiency rate (performance ratio) based on the reading of the energy produced and delivered to the grid and the average incident solar radiation during this period of 30 days.

Performance Ratio of will be calculated as per the formula given below in Point No. 6. If the PR of these fives instances is equal to or more than quoted, then Operational Acceptance Test (OAT) shall be considered successful.

4. In case the PR is found to be lower in the OAT then the bidder may take necessary corrective majeures to achieve the quoted PR to achieve the NEEGG of first year.

5. PR shall be demonstrated against the installed DC Capacity.

6. The Efficiency or performance ratio (PR) of the PV Plant is calculated as follows (according to IEC 61724)

Performance Ratio (PR) = **YA / YR**

Where;

Y_A = Final (actual measured) PV system yield in kilo-watt hours at the point of measurement during the testing period, and

Y_R = Reference yield calculated as the product of the insolation on the plane of the collector (i.e. PV modules) in kWh/ m^2 during the testing period and the installed DC capacity of the plant in kW.

= [Insolation on the plane of the collector (i.e. PV modules) in kWh/ m^2 during the testing period] x Installed DC Capacity

= (kWh/m2) x Installed DC Capacity

Monitoring System for PR Verification

The following instrumentation will be used to determine the Solar Plant Performance:

- Power Meter at the delivery point.
- Power Meter for each inverter for reference only.
- One nos. calibrated pyranometer to determine irradiance on the plane of array (with a target measurement uncertainty of ± 2).
- One nos. calibrated pyranometer to determine irradiance on horizontal plane (with a target measurement uncertainty of ± 2)
- Two nos. thermocouples to measure module temperature with a measurement uncertainty of ±1 °C.
- Shielded ventilated thermocouple with a measurement accuracy of ±1°C.

- An anemometer mounted on a 10m mast to measure wind speed (without additional shadowing on modules).
- Data measurement shall be witnessed in the format mutually agreed before the start of PR test by the employer and the contractor jointly for the said period.
- The Contractor shall show the specified PR for Operational Acceptance.

Part C: The procedure for Performance Guarantee Test (PGT)For NEEGG - shall be as follows:

1. A weather station with a calibrated pyranometer shall be installed by the Contractor at the location mutually agreed by the Contractor and OIL. The test report for the calibration shall be submitted by the Contractor for approval by OIL. The calibration should be traceable to a national/international laboratory. The output of this pyranometer for shall be logged in the SCADA system.
2. In case the pyranometer is found to be working erratically then immediately the Contractor shall take necessary steps to rectify and/or recalibrate the instrument to the satisfaction of OIL. However, for the dispute period for which such error has occurred and until the instrument is recalibrated to the satisfaction of OIL, data from any one of the following list of sources as decided by OIL will be used:
    i. A separate pyranometer installed by the Owner near the site, if available
    ii. Average of two closest solar power projects, as identified by OIL
    iii. Nearest MNRE weather station
3. "Actual Delivered Energy" from the plant supplied by the Contractor shall be noted daily for test period summed up for entire test period. For this purpose, the net delivered energy at the metering point shall be taken into account.
4. The measured value of energy at step (3) shall be compared with '*Quoted NEEGG"'* for first year

7. Further, if the plant is not able to achieve the Quoted *NEEGG* during PGT of first year of O&M period and there is a shortfall in energy generation, then the Contractor shall provide Price Discount as per relevant Clause of the Tender.

6. The Contractor shall share with OIL all the radiation, generation, etc.

parameters details and all other factors necessary for OIL to corroborate the estimate. OIL has the right to cross verify data submitted by the Contractor by all possible means/sources.

Part D - Following factors may be noted for computing the PR Test: From 2nd year onwards

1. Actual measured annual insolation shall only be considered for computing the PR.
2. Effect due to variation of meteorological parameters e.g. ambient temperature, wind speed, humidity etc. shall not be considered.
3. Generation loss due to grid outage (or power evacuation system which is not in the scope of the Contractor): The measured global solar radiation and grid outage hours for the period of grid outage shall be excluded while calculating total average global solar radiation for the PR test to be conducted for the respective year.
4. The PR test shall be conducted as specified in Part-B above

Annexure-VI

LIST OF APPROVED BANKS

SCHEDULED PUBLIC SECTOR BANKS (INDIAN)	**SCHEDULED FOREIGN BANKS**
1. State Bank of India. 2. State Bank of Bikaner and Jaipur 3. State Bank of Hyderabad 4. State Bank of Mysore. 5. State Bank of Patiala. 6. State Bank of Travancore. 7. Allahabad Bank 8. Andhra Bank 9. Bank of Baroda 10. Bank of India 11. Bank of Maharashtra 12. Canara Bank 13. Central Bank of India 14. Corporation Bank 15. Dena Bank 16. Indian Bank 17. Oriental Bank of Commerce 18. Punjab National Bank 19. Punjab and Sind Bank 20. Syndicate Bank 21. Union Bank of India 22. UCO Bank 23. Vijaya Bank. 24. IDBI Bank	1. American Express Bank Ltd. 2. Bank of American NT & SA 3. Bank of Tokyo Ltd. 4. BNP Paribas 5. Barclays Bank Plc 6. Citi Bank NA. 7. Deutsche Bank A.G. 8. Hong Kong & Shanghai Banking Corporation. 9. Standard Chartered Bank 10. JP Morgan Chase Bank NA
SCHEDULED PRIVATE SECTOR BANKS (INDIAN) 1. ING Vysya Bank 2. Axis Bank Ltd. 3. SBI Commercial & International Bank Ltd. 4. ICICI Bank 5. HDFC Bank 6. Yes Bank 7. Indus Ind bank 8. Kotak Mahindra Bank	

ANNEXURE -VII

PREFERRED VENDOR LIST FOR ELECTRICAL ITEMS

SL No.	Item Description	Approved Vendor List
1.	Cables: Control-PVC (130D)	1. ASSOCIATED FLEXIBLES AND WIRES (P) LTD- A132 2. CMI LTD- C019 3. CORDS CABLES INDUSTRIES LTD- C144 4. DELTON CABLES LTD- E012 5. ELKAY TELELINKS LTD- E063 6. EVERSHINE ELECTRICALS- E024 7. FINOLEX CABLES LTD- F013 8. GEMSCAB INDUSTRIES LTD- G146 9. GOYOLENE FIBRES (INDIA) PVT. LTD- G142 10. HAVELL'S INDIA PVT. LTD- H060 11. KEI INDUSTRIES LTD- K082 12. NICCO CORPORATION LTD.- N033 13. NORTH EASTERN CABLES PVT. LTD- N112 14. PARAMOUNT COMMUNICATIONS LTD- P-243 (MANUFACTURING UNIT- PARAMOUNT CABLES CORPORATIONS) 15 POLYCAB WIRES PVT. LTD – P-244 16. RADIANT CABLES PVT. LTD- R047 17. RAVIN CABLES LTD. – R179 18. SUYOG ELECTRICALS LTD. – S304 19. TORRENT CABLES LTD- T124 20. UNIVERSAL CABLES LTD. – U003 21. ASSOCIATED CABLES PVT. LTD- A034 22. ECKO CABLES PVT. LTD- E169 23. HINDUSTAN VIDYUT PRODUCT- H122 24. THERMO CABLES LTD. – T212 25 LAPP INDIA LTD.
2.	SWITCH BOARDS-MV:MCC/PCC/PMCC-DRAWOUT (13BC)	1. BCH ELECTRIC LTD- B002 (TYPE:MCC) 2. CONTROLS &SCHEMATICS LTD-C024 (TYPE:MCC,PCC,PMCC) 3. CONTROLS & SWITCHGEAR LTD-C007 (TYPE MCC,PCC,PMCC) 4. GE INDIA INDUSTRIAL (P) LTD- G147 (TYPE MCC,PCC,PMCC) 5. LARSEN & TOUBRO LTD- L001C (TYPE MCC,PCC,PMCC) 6. SCHNEIDER ELECTRIC INDIA PVT. LTD- S0440 (TYPE MCC,PCC,PMCC) 7. SIEMENS LTD- S003 (TYPE MCC,PCC,PMCC)
3.	SWITCH BOARDS-MV:MCC/ASB/LDB-FIXED TYPE (13BB)	1. BCH ELECTRIC LTD- B002 (TYPE: MCC, LDB,ASB) 2. CONTROLS &SCHEMATICS LTD-C024 (TYPE: MCC, LDB,ASB) 3. CONTROLS & SWITCHGEAR LTD-C007 (TYPE: MCC, LDB,ASB) 4. GE INDIA INDUSTRIAL (P) LTD- G147 (TYPE: MCC,

SL No.	Item Description	Approved Vendor List
		LDB,ASB) 5. LARSEN & TOUBRO LTD- L001C (TYPE: MCC, LDB,ASB) 6. M.K. ENGINEERS & CONTROLS PVT. LTD- M138 (TYPE: MCC, LDB,ASB) 7. SCHNEIDER ELECTRIC INDIA PVT. LTD- S0440(TYPE: MCC, LDB,ASB) 8. SIEMENS LTD- S003 (TYPE: MCC, LDB,ASB)
4.	TRANSFORMERS-DISTRIBUTION-UPTO 4MVA (13KB)	1. BHARAT BIJLEE LTD – B048 2. CROMPTON GREAVES LTD –C010 3. EMCO LTD- E014 4. INDO TECH TRANSFORMERS LTD -1178 5. KANOHAR ELECTRICAL PVT. LTD- K017 6. KIRLOSKAR POWER EQUIPMENT LTD. – K134 7. TRANSFORMERS & RECTIFIERS (I) LTD. – T129 8. VIJAY ELECTRICALS LTD. –V076 9. VOLTAMP TRANSFORMERS (P) LTD –V003 10. AREVA T&D INDIA LTD. – A347 11. RIME TRANSFORMERS & CONDUCTORS PVT. LTD – R163
5.	SIGNAL CABLES (14CB)	1. ASSOCIATED FLEXIBLES AND WIRES (P) LTD – A132 2. CMI LIMITED –C019 3. CORDS CABLES INDUSTRIES LTD. – C144 4. DELTON CABLES LIMITED – D102 5. ELKAY TELELINKS LTD.- E063 6. FINE CORE CABLES PVT. LTD- F139 7. GOYOLENE FIBRES (INDIA) PVT. LTD- G142 8. KEI INDUSTRIES LIMITED – K082 9. LAPP CABLES INDIA LTD, BANGALORE 10. NETCO CABLE INDUSTRIES PVT. LTD- N094 11. NICCO CORPORATION LTD.- N033 12. PARAMOUNT COMMUNICATIONS LTD – P243 13 POLYCAB WIRES PVT. LTD- P244 14. RADIANT CABLES PVT. LTD- R047 15. SUYOG ELECTRICALS LTD. – S304 16. THERMOCABLES LTD. (FORM T-140)- T212 17. UNIVERSAL CABLES LTD. – U003 18. ASSOCIATED CABLES PVT. LTD. – A034
6.	NEUTRAL GROUNDING RESISTORS-H.V. (13 RA)	1. BCH ELECTRIC LTD. – B002 2. RESIITECH ELECTRICALS PVT. LTD. – R062 3. RSI SWITCHGEAR PVT. LTD. – R001 4. SR NARKHEEDE ENGINEERING PVT. LTD. – S146
7.	LIGHTING FIXTURES FOR NON-HAZARDOUS AREA (14LB)	1. BAJAJ ELECTRICALS LTD. – B011 (MANUFACTURER-M/S ALPINE ELECTRICAL MFG.CO.PVT.LTD) 2. CROMPTON GREAVES LTD. –C010 3. PHILIPS INDIA LTD. – P-037 4. HAVELL'S INDIA LTD. – H060

SL No.	Item Description	Approved Vendor List
		5. M/S VENTURE LIGHTING INDIA, CHENNAI
8.	CABLES: HIGH VOLTAGE- XLPE (130A)	1. INDUSTRIAL CABLES (I) LTD- 1028 2. NICCO CORPORATION LTD. – N033 3. POLYCAB WIRES PVT. LTD. – P244 4. TORRENT CABLES LTD. – T124 5. UNIFLEX CABLES LTD. – U084 6. UNIVERSAL CABLES LTD. – U003
9.	H.V. – CAPACITORS	1. ABB LTD, BANGALORE – A200 2. BHEL, BHOPAL- B041A 3. KAPSALES ELECTRICALS LTD.- K029 4. SHREEM CAPACITORS PVT. LTD. – S266 5. UNIVERSALS CABLES LTD. – U003 6. MADHAV CAPACITORS (P) LTD., PUNE
10.	SWITCH BOARDS-HV (INDOOR) WITH VCB ITEM (13BA)	1. ABB LTD., NASIK –A300 2. BHEL, BHOPAL –B041A 3. CROMPTON GREAVES LTD. –C010 4. SIEMENS LTD. – S003 5. AREVA T&D INDIA LTD. –A347 6. JYOTI LTD. –J001

ANNEXURE –VIII

(To be submitted in duplicate)

MANDATE FORM FOR ELECTRONIC PAYMENT THROUGH INTERNET & RBI

To
Oil India Ltd;
2A Saraswati Nagar
Jodhpur -342005
Dear Sir,

Sub: Authorization for release of payment due from OIL INDIA, _ through
Electronic fund transfer (RBI-EFT)/Internet / RTGS.
Refer Order No……..dt……and/or Tender/Enquiry/Letter No……..dt……..

(Please fill in the information in CAPITAL LETTERS. Please TICK wherever it is applicable)

1. Name of the Party :
2. Address of the party …
…….
…….
City:…….Pin Code:…….
E-mail Id: ……..
Permanent Account Number:……

3. Particulars of Bank:

Bank Name		Branch Name	
Branch Place		Branch City	
Pin Code		Branch Code	
MICR No			
(9 Digits code number appearing on the MICR Band of the cheque supplied by the Bank. Please attach Xerox copy of a cheque of your bank for ensuring accuracy of the bank name, branch name and code number)			
Account Type	Savings	Current	Cash Credit
Account Number(as appearing in the Cheque Book)			
RTGS / IFSC Code			

4. Date from which the mandate should be effective:

I hereby declare that the particulars given above are correct and complete. If any transaction is delayed or not effected for reasons of incomplete or incorrect information, I shall not hold Oil India Limited responsible. I also undertake to advise any change in the particulars of my account to facilitate updating of records for purpose of credit of amount through RBI EFT / Internet / RTGS.

Place:
Date:

Signature of the party/Authorized Signatory

Certified that particulars furnished above are correct as per our records.

Bank's Stamp:
Date:
(Signature of the Authorized Official from the Banks)

N.B. : RTGS charges if any, is to be borne by the contractor .

Annexure-IX

Social Accountability 8000 Compliance Format

A. Basic information

Name of the organization		
Address		
Telephone No		
Name of the Proprietor		
Nature of Business		
License Number and date of expiry		
Employees	**Staff (Total Number)**	**Workmen (Total Number)**
• **Permanent**		
• **Casual**		
• **Badli**		
• **Temporary**		
• **Contracted**		

B. Information regarding Social Accountability

- What is the minimum age required to join your organization? _____ Years
- What types of certificates (Like mark sheet, birth certificate) you keep with you? Original Copy / Xerox
- Do you require to keep any kind of deposit inform of cash at the time of employment? Yes/No
- Do you provide safe & healthy work environment as per statutory requirement? Yes/No
- If directly not provided by you, do you get

health & safety benefits from OIL INDIA? Yes/No

- Do you provide personal protective equipment(s) to your employees free of cost? Yes/No
- Do you provide safety training to your employees? Yes/No
- Do you ensure canteen facility for your employees? Yes/No
- If not, do you get the facilities from OIL INDIA Yes/No
- What types of medical benefits you provide to your employees?

_____

_____

_____

_____

_____

_____

- Do you allow trade union and collective bargaining in your organization? Yes/No

  If no, how do you ensure freedom of expression?

_____

_____

_____

_____

- Incase of non-performance of any employee, how do you deal with such situations?

_____

_____

_____

_____

_____

- What are the procedures of hiring/promotion/ remuneration in your organization?

_____

_____

_____

_____

- Do you provide appointment letter to your employees? Yes/No
- Do you maintain a documented terms and conditions of employment? Yes/No
  Do you maintain a disciplinary procedure? Yes/No
- If no, how do you terminate your employee?

_____

_____

_____

- How do you ensure that your employees are not discriminated on the basis of caste, creed, gender, religion, age and dieses?

_____

- How many shift you have? _____ shifts
- What is the official working time? _____ hours

- Which day is off day in your organization? _____
- In case, a person works in off day or holiday, how is he/she compensated?

_____

_____

_____

- Do you pay overtime to your employees as per law? Yes/No
- What is the lowest amount (salary/wage) you pay to your employees? INR_____/-
- Is there any case of deduction in wage? Yes/No
- In case, it is yes, what are the general reasons for such deduction?

_____

_____

_____

_____

- Is there any apprentice period in your organization? Yes/No
- If yes, what is the apprentice period in your organization? _____
- Do you have any international certification Yes/No
- If yes, please specify

_____

_____

- Do you receive, handle or promote goods and/or services

from supplier/subcontractors or sub-suppliers Yes/No

- Do you receive, handle or promote goods and/or services from supplier/subcontractors or sub-suppliers who are classified as home worker? Yes/No

- If yes, what steps you have taken to ensure that they get similar level of protection as afforded to directly employed employees?

_____

_____

_____

- Have you taken care to look into issues related to child labour Forced labour, health & safety, working hours and remuneration of your suppliers Yes/No

We do hereby declare that our organization is committed to social accountability. We will promptly implement remedial/corrective actions identified against the requirement and promptly inform your organization. We also declare that the sub contractors/sub supplier's performances are monitored by us. Moreover, we declare that if invited, we shall participate in awareness program as well as monitoring program organized by you.
We declare that the above-mentioned information are correct.

Signature:

Designation:

Date Seal of the organization

Annexure-X

BIDDER INFORMATION

1. Name of the bidder(s)
2. Address :

   Street

   City

   Postal Code

   State

   Country
3. Contact numbers :

   Tel No
   Mobile
   Fax No
   E mail id
4. Currency :
5. Excise Details :

   ECC No
   Excise Reg No
   Excise Range
   Excise Division
   Excise Commissioner ate
6. SSI Status
7. CST No
8. LST No
9. Permanent Account Number
10. VAT Registration /TIN No
11. Bank Account No

Signature of the Bidder

Annexure-XI

CONTRACT FORM

This Agreement is made on ____ day of _____ between Oil India Limited, a Government of India Enterprise, incorporated under the Companies Act 1956, having its registered office at Duliajan, Assam and Rajasthan Project Office at Jodhpur in the State of Rajasthan, hereinafter called the "Company" which expression unless repugnant to the context shall include executors, administrators and assignees on the one part, and M/s. _____ (Name and address of Contractor) hereinafter called the "Contractor" which expression unless repugnant to the context shall include executors, administrators and assignees on the other part,

WHEREAS the Company desires that Services _____ (brief description of services) should be provided by the Contractor as detailed hereinafter or as Company may requires;

WHEREAS, Contractor engaged themselves in the business of offering such services represents that they have adequate resources and equipment, material etc. in good working order and fully trained personnel capable of efficiently undertaking the operations and is ready, willing and able to carry out the said services for the Company as per Section-III attached herewith for this purpose and

WHEREAS, Company had issued a firm Letter of Award No. _____ dated _____ based on Offer No. _____ dated _____ submitted by the Contractor against Company's IFB No. _____. All these aforesaid documents shall be deemed to form and be read and construed as part of this agreement/contract. However, should there be any dispute arising out of interpretation of this contract in regard to the terms and conditions with those mentioned in Company's tender document and subsequent letters including the Letter of Award and Contractor's offer and their subsequent letters, the terms and conditions attached hereto shall prevail. Changes, additions or deletions to the terms of the contract shall be authorized solely by an amendment to the contract executed in the same manner as this contract.

NOW WHEREAS, in consideration of the mutual covenants and agreements hereinafter contained, it is hereby agreed as follows -

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. In addition to documents herein above, the following Sections and Annexures attached herewith shall be deemed to form and be read and construed as part of this agreement viz.:

(a) Section-I indicating the General Conditions of Contract,
(b) Section-II indicating the Terms of Reference / Technical Specifications,
(c) Section-III indicating the Schedule of rates and
(d) Section – IV indicating the Special Conditions of Contract.

3. In consideration of the payments to be made by the Company to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Company to provide the Services and to remedy defects therein in conformity in all respect with the provisions of this Contract.

4. In consideration of the payments to be made by the Company to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Company to provide the Services and to remedy defects therein in conformity in all respect with the provisions of this Contract.

5. The Company hereby covenants to pay the Contractor in consideration of the provision of the Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of this Contract at the times and in the manner prescribed by this Contract.

IN WITNESS thereof, each party has executed this contract at Jodhpur, Rajasthan as of the date shown above.

Signed, Sealed and Delivered,

For and on behalf of Company (Oil India Limited)	For and on behalf of Contractor (M/s. _____)
Name:	Name:
Status:	Status:
In presence of	In presence of
1.	1.
2.	2.

---

* Bidders are NOT required to complete this form.

ANNEXURE-XII

INTEGRITY PACT

Between Oil India Limited (OIL) hereinafter referred to as "The Principal"

And

(Name of the bidder) ..... hereinafter referred to as "The Bidder/Contractor"

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for Tender No. SJI3301P20. The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organization "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an external independent
Monitor who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 - Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.

2. The Principal will, during the tender process treat all Bidders with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential/additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.

3. The Principal will exclude from the process all known prejudiced persons.

2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

1. The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2. The Bidder/Contractor will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, Subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

3. The Bidder/Contractor will not commit any offence under the relevant Anticorruption Laws of India; further the Bidder/Contractor will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

4. The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 - Disqualification from tender process and exclusion from future Contracts

If the Bidder, before contract award has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or risibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

1. If the Bidder/Contractor has committed a transgression through a violation ofSection 2 such as to put his reliability or credibility into question, the Principal is entitled also to exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressions within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.
2. The Bidder accepts and undertakes to respect and uphold the Principal's Absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.
3. If the Bidder/Contractor can prove that he has restored/recouped the Damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.
4. A transgression is considered to have occurred if in light of available evidence no reasonable doubt is possible.

Section 4 - Compensation for Damages

1. If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to 3 % of the value of the offer or the amount equivalent to Earnest Money Deposit/Bid Security, whichever is higher.

2. If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

3. The bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder/Contractor can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount or the liquidated damages, the Bidder/Contractor shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 - Previous transgression

1. The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/Contractor/Subcontractors

1. The Bidder/Contractor undertakes to demand form all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

2. The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors and Subcontractors.

3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 - Criminal charges against violating Bidders/Contractors/ Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 - External Independent Monitor/Monitors (three in number depending on the size of the contract)(to be decided by the Chairperson of the Principal)

1. The Principal appoints competent and credible external independent Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what

extent the parties comply with the obligations under this agreement.

2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.

3. The Contractor accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/Contractor/Subcontractor with confidentiality.

4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

5. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

6. The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.

7. If the Monitor has reported to the Chairperson of the Board a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8. The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by Chairperson of the Principal.

Section 10 - Other provisions

1. This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi.

2. Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

3. If the Contractor is a partnership or a consortium, this agreement must be, signed by all partners or consortium members.

4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intensions.

---	---
For the Principal	For the Bidder/Contractor
Place:	Witness 1 : .....
Date:	Witness 2 : .....

ANNEXURE-XIII

HSE GUIDELINES

GENERAL HSE POINTS TO BE INCORPORATED IN THE CONTRACT

1. It will be solely the Contractor's responsibility to fulfill all the legal formalities with respect to the Health, Safety and Environmental aspects of the entire job (namely; the person employed by him, the equipment, the environment, etc.) under the jurisdiction of the district of that state where it is operating. All sub-contractors hired by him must comply with the same requirement as the contractor himself and shall be liable for ensuring compliance all HSE laws by the sub or sub-sub-contractors.

2. Every person deployed by the contractor in the project must wear safety gadgets to be provided by the contractor. The Contractor shall provide proper Personnel Protective Equipment as per the hazard identified and risk assessed for the job and conforming to statutory requirement and company PPE schedule. Safety appliances like protective footwear, Safety Helmet and Full Body harness has to be DGMS/BIS approved. Necessary supportive document shall have to be submitted as proof. If the Contractor fails to provide the safety items as mentioned above to the working personnel, the Contractor may apply to the Company (OIL) for providing the same. OIL will provide the safety items, if available. But in turn, OIL will recover the actual cost of the items by deducting from Contractor's Bill. . However, it will be the Contractor's sole responsibility to ensure that the persons engaged by him in the site(s) use the proper PPE while at work.

   All the safety gears mentioned above are to be provided to the working personnel before commencement of the work.

3. The Contractor shall prepare written Safe Operating Procedure (SOP) for the work to be carried out, including an assessment of risk, wherever possible and safe methods to deal with it/them. The SOP should clearly state the risk arising to men, machineries & material from the operations to be done by the contractor and how it is to be managed.

4. The contractor shall provide a copy of the SOP to the person designated by the owner i.e Site Engineer who shall be supervising the contractor's work.

5. Keep an up to date SOP and provide a copy of changes to a person designated by the Engineer In charge.

6. Contractor has to ensure that all work is carried out in accordance with the Statute and SOP and for the purpose he may deploy adequate qualified and competent personnel for the purpose of carrying out the job in a safe manner. For work of a specified scope/nature, he should develop and provide to the owner a site(s) specific code of practice.

7. All persons deployed by the contractor for working in the project must undergo Tower climbing training initial medical examination, PME. They should be issued cards stating the name of the contractor and the work and its validity period, indicating status of IME & PME.

8. The contractor shall ensure that the person working must have electrical Supervisor,

certificate from competent authority of state Government such as Chief Electrical Inspector or equivalent as provided in the act.

9. The return shall be submitted quarterly (by 10th of April, July, October & January) for contracts of more than one year. However, for contracts of less than one year, returns shall be submitted monthly.

10. It will be entirely the responsibility of the Contractor/his Supervisor/representative to ensure strict adherence to all HSE measures and statutory rules during operation in project site(s) and safety of workers engaged by him. The crew members will not refuse to follow any instruction given by Company's Site Engineer / Official for safe operation.

11. Any compensation arising out of the job carried out by the Contractor whether related to pollution, Safety or Health will be paid by the contractor only.

12. Any compensation arising due to accident of the Contractor's personnel while carrying out the job, will be payable by the contractor.

13. The contractor shall have to report all incidents including near miss to Site Engineer of OIL India within 24 hours of any such occurrence.

14. The contractor has to keep a register of the persons employed by him/her. The contractor's Work Site Supervisor shall take and maintain attendance of his men every day for the work, punctually.

15. If the company arranges any safety class / training for the working personnel at site (company employee, contractor worker, etc) the contractor will not have any objection to any such training.

16. The health checkup of contractor's personnel is to be done by the contractor in authorized Health Centers as per OIL's requirement & proof of such test(s) is to be submitted to OIL. The frequency of periodic medical examinations should be every five years for the employees below 45 years of age and every three years for employees of 45 years of age and above.

17. To arrange daily tool box meeting and regular site safety meetings and maintain records.

18. A contractor employee must, while at work, take reasonable care for the health and safety of people who are at the employee's place of work and who may be affected by the employee's act or omissions at work.

19. A contractor employee must, while at work, cooperate with his or her employer or other persons so far as is necessary to enable compliance with any requirement under the act or the regulations that is imposed in the interest of health, safety and welfare of the employee or any other person.

20. Contractor's arrangements for health and safety management shall be consistent with those for the project owner.

21. In case Contractor is found non-compliant of HSE laws as required company will have the right for directing the contractor to take action to comply with the requirements, and for further non-compliance, the contractor will be penalized prevailing relevant Acts/Rules/Regulations.

22. When there is a significant risk to health, environment or safety of a person or place arising because of a non-compliance of HSE Measures Company will have the right to direct the contractor to cease work until the non-compliance is corrected.

23. The contractor should prevent the frequent change of his contractual employees as far as practicable.

24. The contractor should frame a mutually agreed bridging document between OIL & the contractor with roles and responsibilities clearly defined.

25. For any HSE matters not specified in the contract document, the contractor will abide the relevant and prevailing Acts/rules/regulations/ pertaining to Health, Safety and Environment.

*****

Annexure-XIV

Format of undertaking by Bidders towards submission of authentic information/documents
(To be typed on the letter head of the bidder)

Ref. No_____ Date _____

Sub: Undertaking of authenticity of information/documents submitted
Ref: Your tender No. SJI3301P20 Date: 06.12.2019

To,
OIL INDIA LIMITED,
RAJASTHAN FIELDS,
JODHPUR, RAJASTHAN

Sir,

With reference to our quotation against your above-referred tender, we hereby undertake that no fraudulent information/documents have been submitted by us.

We take full responsibility for the submission of authentic information/documents against the above cited bid.

We also agree that, during any stage of the tender/contract agreement, in case any of the information/documents submitted by us are found to be false/forged/fraudulent, OIL has right to reject our bid at any stage including forfeiture of our EMD and/or PBG and/or cancel the award of contract and/or carry out any other penal action on us, as deemed fit.

Yours faithfully,
For (type name of the firm here)

Signature of Authorised Signatory

Name :

Designation :

Phone No.

Place :

Date :

(Affix Seal of the Organization here, if applicable)

*****

ANNEXURE-XV

STATEMENT OF COMPLIANCE
(Only exceptions/deviations to be rendered)

SECTION NO. (PAGE NO.)	CLAUSE NO. SUB-CLAUSE NO.	COMPLIANCE/ NON COMPLIANCE	REMARKS

(Authorised Signatory)
Name of the Bidder : _____

NOTE : OIL INDIA LIMITED expects the bidders to fully accept the terms and conditions of the bid document. However, should the bidders still envisage some exceptions/deviations to the terms and conditions of the bid document, the same should be indicated here and put in their Bid. If the statement is left blank, then it would be presumed that the bidder has not taken any exception/deviation to the terms and conditions of the bid document.

ANNEXURE-XVI

LETTER OF AUTHORITY

TO
CGM (SERVICES)
Materials & Contracts Department
Oil India Ltd., Rajasthan Fields
Jodhpur-342005
Rajasthan, India

Sir,

Sub: OIL's Tender No. SJI3301P20

We _____ confirm that Mr./Ms. _____ (Name and address) is authorised to represent us to Bid, negotiate and conclude the agreement on our behalf with you against Tender Invitation No. _____ for Engineering, Procurement and Construction (EPC) contract for Hybrid project consisting 41 (±5%) MW capacity Wind Energy Project & 14 MW solar PV project at suitable site in state of Gujarat with its Comprehensive Operation & Maintenance for 25 years.

We confirm that we shall be bound by all and whatsoever our said representative shall ommit.

Yours Faithfully,

Authorised Person's Signature: _____

Name: _____

Designation: _____

Seal of the Bidder:

Note: This letter of authority shall be on printed letter head of the Bidder and shall be signed by a person competent and having the power of attorney (power of attorney shall be annexed) to bind such Bidder. If signed by a consortium, it shall be signed by members of the consortium.

ANNEXURE-XVII

AUTHORIZATION FOR ATTENDING BID OPENING

Date: _____

TO
CGM (SERVICES)
Materials & Contracts Department
Oil India Ltd., Rajasthan Fields
Jodhpur-342005
Rajasthan, India

Sir,

Sub: OIL's Tender No. SJI3301P20

We hereby authorise Mr. /Ms. _____ (Name and address) to be present at the time
of Un-priced Bid Opening / Price Bid Opening and for any subsequent correspondence / communication of the above Tender due on _____ on our behalf.

Yours Faithfully,

Authorised Person's Signature: _____

Name: _____

Designation: _____

Seal of the Bidder:

Note: This letter of authority shall be on printed letter head of the Bidder and shall be signed by a person who signs the bid.

***

APPENDIX-I

Guidelines to bidders for participating in OIL's e-Procurement tenders

Bid invitations (Tenders)

The details of e-Procurement tenders can be accessed from our e-Procurement site. https://etender.srm.oilindia.in/sap/bc/gui/sap/its/bbpstart/!

To view e-Procurement tenders you need to login using your login id & password to view all tenders available for you.

If you do not have a user id, please click on Guest login button to view available open tenders.

Pre-requisites to submit tenders on line through e-Procurement Portal

Bidders should have a valid User Id to access OIL e-Procurement site.

Bidders should have a legally valid Class 3 digital certificate with Organizations Name as per Indian IT Act from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India.

Tender fee must have been paid, if applicable for the Bid Invitation. If Bidder is exempt from paying tender fee, Bidder must hold exemption from the Tender Officer.

Bidder should fulfill any other pre-requisites mentioned in the tender documents of a specific tender.

Obtaining User Id to access OIL e-Procurement site

Initially user id and password will be assigned to you.

Please send your updated mailing address with pin code, phone number, fax number and

Email ID to the us at erp_mm@oilindia.in.

Bidders interested in a particular bid invitation should apply for user id at least 7 days prior to the last date mentioned (Last Date for Tender Fee Payment, if exists or Submission Deadline) in the bid invitation.

Instructions for obtaining Digital Certificate

In order to bid for OIL e-tenders all the vendors are required to obtain a legally valid digital certificate as per Indian IT Act from the licensed Certifying Authorities (CA) operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India. (http://www.cca.gov.in/)

Steps for obtaining Digital Certificate

Visit the site of the licensed CA using internet browser.

Apply online for a class 3 digital certificate for the designated individual with organization name. Ensure the Digital Certificate is legally valid in India.

For making payment and submission of documents required for issue of the Digital Certificate, follow the instructions on the CA's website.

Use the class 3 Digital Certificate thus obtained for online bidding on OIL e-Procurement site.

Links to some licensed CA's are provided below

1. TCS

ANNEXURE - A

CERTIFICATE OF ANNUAL TURNOVER & NET WORTH

TO BE ISSUED BY PRACTISING **CHARTERED ACCOUNTANTS' FIRM** ON THEIR LETTER HEAD

TO WHOM IT MAY CONCERN

This is to certify that the following financial positions extracted from the audited financial statements of M/s..... (Name of the Bidder) for the last three (3) completed accounting years upto .....**(as the case may be)** are correct.

YEAR	TURN OVER In INR (Rs.) Crores / US $ Million)*	NET WORTH In INR (Rs.) Crores / US $ Million)*
[redacted]		
	[redacted]	

*Rate of Conversion (if used any): USD 1.00 = INR.....

Place:
Date:

Seal:

Membership No. :
Registration Code:

Signature

*** Applicable only for GLOBAL tenders.**

Attachment – I

FORMAT OF AGREEMENT BETWEEN BIDDER AND THEIR PARENT COMPANY / WHOLLY OWNED *SUBSIDIARY COMPANY (As the case may be)*

(TO BE EXECUTED ON STAMP PAPER OF REQUISITE VALUE AND NOTORISED)

This agreement made this ___ day of ____ month ____ year by and between M/s. _____ (Fill in the Bidder's full name, constitution and registered office address) hereinafter referred to as Bidder on the first part and M/s. _____ (Fill in full name, constitution and registered office address of Parent Company/Subsidiary Company, as the case may be) hereinafter referred to as "Parent Company/ Subsidiary Company (Delete whichever not applicable)" of the other part:

WHEREAS

M/s. Oil India Limited (hereinafter referred to as OIL) has invited offers vide their tender No. _____ for _____ and M/s. _____(Bidder) intends to bid against the said tender and desires to have technical support of M/s. _____[Parent Company/ Subsidiary Company-(Delete whichever not applicable)] and whereas Parent Company/ Subsidiary Company (Delete whichever not applicable) represents that they have gone through and understood the requirements of subject tender and are capable and committed to provide the services as required by the Bidder for successful execution of the contract, if awarded to the Bidder.

Now, it is hereby agreed to by and between the parties as follows:

1. M/s._____(Bidder) will submit an offer to OIL for the full scope of work as envisaged in the tender document as a main Bidder and liaise with OIL directly for any clarifications etc. in this context.
2. M/s. _____ (Parent Company/ Subsidiary Company (Delete whichever not applicable) undertakes to provide technical support and expertise, expert manpower and procurement assistance and project management to support the Bidder to discharge its obligations as per the Scope of work of the tender / Contract for which offer has been made by the Parent Company/Subsidiary Company (Delete whichever not applicable) and accepted by the Bidder.
3. This agreement will remain valid till validity of Bidder's offer to OIL including extension if any and till satisfactory performance of the contract in the event the contract is awarded by OIL to the Bidder
4. It is further agreed that for the performance of work during contract period Bidder and Parent Company/Subsidiary Company (Delete whichever not applicable) shall be jointly and severely responsible to OIL for satisfactory execution of the contract.
5. However, the Bidder shall have the overall responsibility of satisfactory execution of the contract awarded by OIL.

In witness whereof the parties hereto have executed this agreement on the date mentioned above.

For and on behalf of (Bidder)	For and on behalf of (Parent Company/Subsidiary Company (Delete whichever not applicable)
M/s.	M/s.
Witness:	Witness:
1)	1)
2)	2)

Attachment – II

PARENT COMPANY/ SUBSIDIARY COMPANYGUARANTEE *(Delete whichever not applicable)*

(TO BE EXECUTED ON STAMP PAPER OF REQUISITE VALUE AND NOTORISED)

DEED OF GUARANTEE

THIS DEED OF GUARANTEE executed at ……. this …….. day of …….. by M/s ……. (Mention complete name) a company duly organized and existing under the laws of …….. (Insert jurisdiction/country), having its Registered Office at …… hereinafter called "the Guarantor" which expression shall, unless excluded by or repugnant to the subject or context thereof, be deemed to include its successors and permitted assigns.

WHEREAS

M/s Oil India Limited, a company duly registered under the Companies Act 1956, having its Registered Office at Duliajan in the State of Assam, India, and having an office, amongst others, at Kakinada, Andhra Pradesh, and Jodhpur, Rajasthan, India hereinafter called "OIL" which expression shall unless excluded by or repugnant to the context thereof, be deemed to include its successor and assigns, invited tender number …….. for …….. on ……..

M/s …….. (Mention complete name), a company duly organized and existing under the laws of …….. (Insert jurisdiction/country), having its Registered Office at …….. (give complete address) hereinafter called "the Company" which expression shall, unless excluded by or repugnant to the subject or context thereof, be deemed to include its successor and permitted assigns, have, in response to the above mentioned tender invited by OIL, submitted their bid number …….. to OIL with one of the condition that the Company shall arrange a guarantee from its parent company guaranteeing due and satisfactory performance of the work covered under the said tender including any change therein as may be deemed appropriate by OIL at any stage.

The Guarantor represents that they have gone through and understood the requirement of the above said tender and are capable of and committed to provide technical and such other supports as may be required by the Company for successful execution of the same.

The Company and the Guarantor have entered into an agreement dated …….. as per which the Guarantor shall be providing technical and such other supports as may be necessary for performance of the work relating to the said tender.

Accordingly, at the request of the Company and in consideration of and as a requirement for OIL to enter into agreement(s) with the Company, the Guarantor hereby agrees to give this guarantee and undertakes as follows:

1. The Guarantor (Parent Company / **Wholly Owned *Subsidiary Company (Delete whichever not applicable***) unconditionally agrees that in case of non-performance by the Company of any of its obligations in any respect, the Guarantor shall, immediately on receipt of notice of demand by OIL, take up the job without any demur or objection, in continuation and without loss of time and without any cost to OIL and duly perform the obligations of the Company to the satisfaction of OIL.
2. The Guarantor agrees that the Guarantee herein contained shall remain valid and enforceable till the satisfactory execution and completion of the work (including discharge of the warranty obligations) awarded to the Company.
3. The Guarantor shall be jointly with the Company as also severally responsible for satisfactory performance of the contract entered between the Company and OIL.
   The liability of the Guarantor, under the Guarantee, is limited to the 50% of the annualized contract price entered between the Company and OIL. This will, however, be in addition to the forfeiture of the Performance Guarantee furnished by the Company.
4. The Guarantor represents that this Guarantee has been issued after due observance of the appropriate laws in force in India. The Guarantor hereby undertakes that the Guarantor shall obtain and maintain in full force and effect all the governmental and other approvals and consents that are necessary and do all other acts and things

necessary or desirable in connection therewith or for the due performance of the Guarantor's obligations hereunder.

5. The Guarantor also agrees that this Guarantee shall be governed and construed in accordance with the laws in force in India and subject to the exclusive jurisdiction of the courts of ……., India.
6. The Guarantor hereby declares and represents that this Guarantee has been given without any undue influence or coercion, and that the Guarantor has fully understood the implications of the same.
7. The Guarantor represents and confirms that the Guarantor has the legal capacity, power and authority to issue this Guarantee and that giving of this Guarantee and the performance and observations of the obligations hereunder do not contravene any existing laws.

For & on behalf of (Parent Company/Subsidiary Company (Delete whichever not applicable))

M/s _____

Witness:
1. Signature _____
Full Name _____
Address _____

Signature _____
Name _____
Designation _____

Common seal of the Company_____

Witness:
2. Signature _____
Full Name _____
Address _____

INSTRUCTIONS FOR FURNISHING PARENT/SUBSIDIARY COMPANY GUARANTEE

1. Guarantee shall be executed on stamp paper of requisite value and notarized.

2. The official(s) executing the guarantee shall affix full signature (s) on each page.

3. Resolution passed by Board of Directors of the guarantor company authorizing the signatory(ies) to execute the guarantee, duly certified by the Company Secretary shall be furnished alongwith the Guarantee.

4. Following certificate issued by Company Secretary of the guarantor company shall also be enclosed along with the Guarantee.

   "Obligation contained in the deed of guarantee No._____ furnished against tender No. _____ are enforceable against the guarantor company and the same do not, in any way, contravene any law of the country of which the guarantor company is the subject"

Attachment – III

FORMAT OF AGREEMENT BETWEEN BIDDER THEIR SISTER SUBSIDIARY/CO-SUBSIDIARY COMPANY AND THE ULTIMATE PARENT/HOLDING COMPANY OF BOTH THE BIDDER AND THE SISTER SUBSIDIARY/CO-SUBSIDIARY (Strike out whichever is not applicable between Ultimate Parent and Holding Company. Similarly strike out whichever is not applicable between Sister Subsidiary and Co-subsidiary Company)

(TO BE EXECUTED ON STAMP PAPER OF REQUISITE VALUE AND NOTORISED)

This agreement made this ___ day of ____ month ____ year by and between M/s. _____ (Fill in Bidder's full name, constitution and registered office address) _____ hereinafter referred to as "Bidder" of the first part and

M/s. _____ (Fill in full name, constitution and registered office address of Sister Subsidiary/Co-subsidiary Company of the Bidder) herein after referred to as "Sister Subsidiary/ Co-subsidiary" of the second part and

M/s_____(Fill in the full name, constitution and registered office address of the Ultimate Parent/Holding Companies of both the subsidiaries) hereinafter referred to as "Ultimate Parent/ Holding Company" of the third part.

WHEREAS

M/s. Oil India Limited (hereinafter referred to as OIL) has invited offers vide their tender No. _____ for _____ and

M/s. _____(Bidder) intends to bid against the said tender and desires to have a technical support of M/s. _____(Sister Subsidiary/Co-subsidiary Company) and

Sister Subsidiary/Co-subsidiary Company represents that they have gone through and understood the requirements of subject tender and are capable and committed to provide the services as required by the Bidder for successful execution of the contract, if awarded to the Bidder.

Now, it is hereby agreed to by and between all the three parties as follows:

1. M/s._____(Bidder) will submit an offer to OIL for the full scope of work as envisaged in the tender document.
2. M/s. _____(Sister Subsidiary/Co-subsidiary Company) undertakes to provide technical support and expertise and expert manpower, material, if any, to support the Bidder to discharge its obligations as per the Scope of work of the tender / Contract for which offer has been made by the Bidder.
3. This agreement will remain valid till validity of Bidder's offer to OIL including extension if any and also till satisfactory performance of the contract in the event the bid is accepted and contract is awarded by OIL to the Bidder.
4. Sister Subsidiary/ Co-subsidiary Company unconditionally agrees that in case of award of contract to the Bidder, if the Bidder is unable to execute the contract, they shall, immediately on receipt of notice by OIL, take up the job without any demur or objection, in continuation without loss of time and without any extra cost to OIL and duly perform the obligations of the Bidder/Contractor to the satisfaction of OIL.
5. The Ultimate Parent/Holding Company also confirms and undertakes that the commitment made by the Sister Subsidiary/ Co-subsidiary company in providing the technical support and technical expertise and expert manpower to support the Bidder for execution of the contract are honoured.
6. The Ultimate Parent/Holding Company also takes full responsibility in getting the contract executed through the Sister subsidiary/ Co-subsidiary company in case the Bidder/Contractor is unable to execute the contract.
7. In witness whereof the parties hereto have executed this agreement on the date mentioned above.

For and on behalf of (Bidder)	For and on behalf of (Sister Subsidiary/Co-subsidiary)	For and on behalf of (Ultimate Parent / Holding Company)
M/s. Witness 1) 2)	M/s. Witness 1) 2)	M/s. Witness 1) 2)

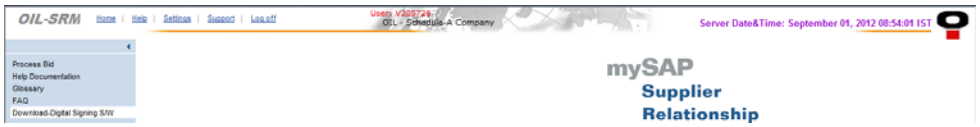
Note: In case of contracts involving - (a) manufacture/supply (b) installation and commissioning (c) servicing and maintenance of any equipment, as the bidding company can draw on the experience of their multiple subsidiary sister/Co-subsidiary company (ies) specializing in each sphere of activity, i.e. (a) manufacture/supply (b) installation and commissioning (c) servicing and maintenance, therefore, in that case, the above format shall be signed by all the sister/Co-subsidiary company(ies) and necessary modifications may be made in the above format to include all sister subsidiaries.

****

2. Safescrypt
3. MTNL Trustline
4. (n)Code Solutions
5. e-mudhra etc.

Technical Settings

1. **Web Browser Supported**: Microsoft IE Ver 6.0 or higher recommended
2. **Java:** To view some of the components, you need to install Java Internet component JDK 5.0 from http://java.sun.com/javase/downloads/index.jsp
3. **Proxy**: If you are unable to access OIL e-Procurement site or Bid Documents, check if you are using proxy to connect to internet or if your PC is behind any firewall. Contact your system administrator to enable connectivity. Please note that standard Port for HTTPS (443) connectivity should be enabled on your proxy/firewall. Dial-up internet connectivity without Proxy settings is another option.
4. **Pop-ups**: Pop-ups should be enabled on OIL e-Procurement URL and Bid Documents URLs. This is required to view tender documents.
5. **Recommended Screen Resolution**: 1024 by 768 pixels.
6. **Internet Speeds**: If you are experiencing slow connectivity to OIL e-Procurement, then contact your system administrator/ISP provider for desirable speeds.
7. **Active-x controls**: Maintain the settings as described in Internet Explorer settings document to enable digital signature signing and verification.

Parameter	Value
Allow Scrip lets	Enable
Automatic prompting for ActiveX controls	Enable
Binary and script behaviors	Enable
Download signed ActiveX controls	Enable
Download unsigned ActiveX controls	Enable
Initialize and script ActiveX controls not marked as safe	Enable
Run ActiveX controls and plug-ins	Enable
Script ActiveX controls marked safe for scripting	Enable
Use Pop-up Blocker	Disable

8. **Digital signature client SW / component:** To use Digital Signature, a client level Software is required. This is third party software from Safes crypt. This is installed automatically, once you start working on OIL's e-procurement system. A popup will come before it starts installation. You need to ensure you have administrative rights on the PC or the laptop. This installation is one time activity for a PC or Laptop. The same can also be Download from the Portal after Logging into the portal. Please see the screen shot below for the location: