Date: 05th Sept, 2017.

The Registrar,

National Electric Power Regulatory Authority,

NEPRA Towers, Sector G-5/1, Islamabad.

Subject: **License Proposed Modification Application for 100 MW Zorlu Solar Pakistan (Pvt.) Ltd**

Dear Sir,

I, **Syed Mumtaz Hassan** being the duly authorized representative of **Zorlu Solar Pakistan (Pvt.) Ltd** by Board Resolution hereby apply to National Electric Power Authority for the modification of Generation License No. **NEPRA/R/DL/LAG-391/14274-80** dated **18th August, 2017** pursuant to section to Regulation 10(2) of the National Electric Power Regulatory Authority (Application and Modification Procedure) Regulations, 1999 (the "AMPR")

I certify that the documents-in-support attached with this application are prepared and submitted in conformity with the provisions of the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999 and undertake to abide by the terms and provisions of the above-said regulations. I further undertake and confirm that the information provided in the attached documents-in-support is true and correct to the best of my knowledge in belief.

A BANK DRAFT in sum of Rupees **375,240/** being the non-refundable license application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, is also attached herewith.

The application is filed in triplicate with all annexures appended with each set of the application.

Sincerely,

Syed Mumtaz Hassan,

Country Manager,

Zorlu Solar Pakistan (Pvt.) Ltd.

ZORLU SOLAR PAKISTAN (PRIVATE) LIMITED

CORPORATE RESOLUTION

It is certified that the following extract resolution has been approved by the Board of Directors of M/s. Zorlu Solar Pakistan (Private) Limited (the "Company") during the Board of Directors meeting on January 06, 2017 held at Levent 199 Büyükdere Caddesi No:199 34394, Istanbul, Turkey.

RESOLVED that this company, Zorlu Solar Pakistan (Private) Limited ("Company") authorizes Mr. Syed Mumtaz Hassan, holding CNIC No: 42301-4366039-3, son of Syed Muhammad Mazhar-ul-Hassan and resident of 701-1, Oyster View Residency, Block-2, Clifton, Karachi Pakistan (the "Authorized Person"), to represent and bind the Company and to enter into negotiations with the Federal and/or any Provincial Government of Pakistan or any relevant governmental authority, to exchange information with governmental authorities, to send and receive formal documentation, to sign necessary documentation requested by governmental authorities stated above, and; to do all such acts, deeds, matters, and things and to execute all such other documents as may be ancillary or incidental or as the Authorized Person shall think expedient for the scope aforesaid.

Name	Specimen Signature
Mr. Syed Mumtaz Hassan	

Olgun Zorlu	Mehmet Emre Zorlu	Ömer Yüngül
Director / Chief Executive	Director	Director

ZORLU
www.zorlu.com.tr
ZORLU SOLAR PAKISTAN (PRIVATE) LIMITED
Registered Office: C-117, Clifton Block 2, Karachi Tel: 021-35291682, 35875366, Fax: 021-95291681

1. TEXT OF THE PROPOSED MODIFICATION

Zorlu Solar Pakistan (Pvt.) Ltd (the "Company") has selected First Solar Series-4 PV modules and Siemens-WSTECH inverters for its 100 MW Solar Power Plant to be in Quaid-e-Azam Solar Park, Bahawalpur. Company has finalized the equipment for the Project. The Company desires to modify its Generation License by changing the following:

a) Power Output and quantity of PV modules while staying with the same type i.e. series-4 and having no impact on the installed capacity
b) Changing DC-AC inverter from SunGrow to Siemens-WSTECH.

In relation, please find the revised Schedule-I of the Generation License attached herewith as Annexure 1. Furthermore, The Schedule-II will remain the same.

2. STATEMENTS OF REASONS IN SUPPORT OF MODIFICATIONS

The Company has been informed by its EPC contractor that the numbers and rating of Modules should to be changed per availability in the production facility during the timelines of Project construction. However, the PV modules remain to be of the same type and there is minor difference in the rating of module, hence slightly affecting the quantity. Moreover, the inverters of rated power 4000 kW of Siemens WSTECH, being more reliable, have been selected.

Further to above, the proposed modification in Generation License shall neither effect net capacity factor nor affect the net installed capacity of the Project.

In view of the foregoing, the Company hereby requests NEPRA to approve the proposed modification to Generation License as such modification will allow the company to proceed further with the project.

3. STATEMENT OF IMPACT ON TARIFF

As energy yield or capacity factor of Solar Power Plant shall remain the same and there will be no change in EPC price or O&M price, so there will be no impact on Tariff due to proposed modification.

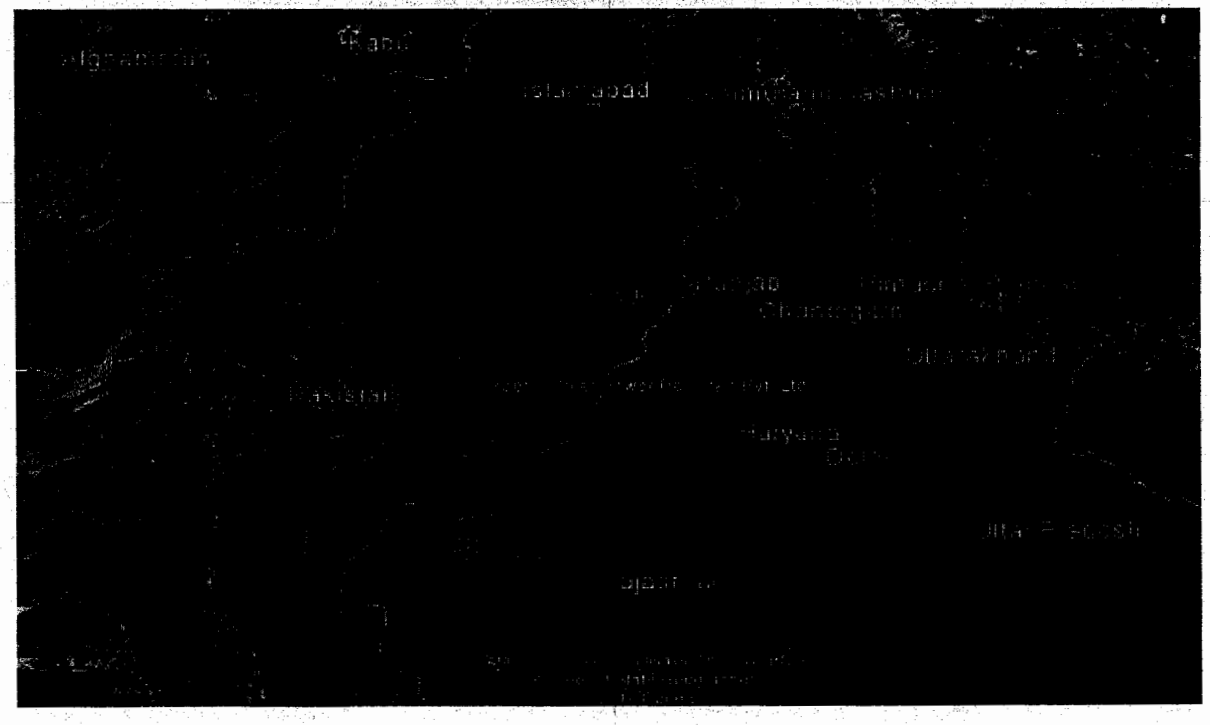
ANNEXURE-1

REVISED SCHEDULE-I OF LPM.

SCHEDULE-I

The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule.

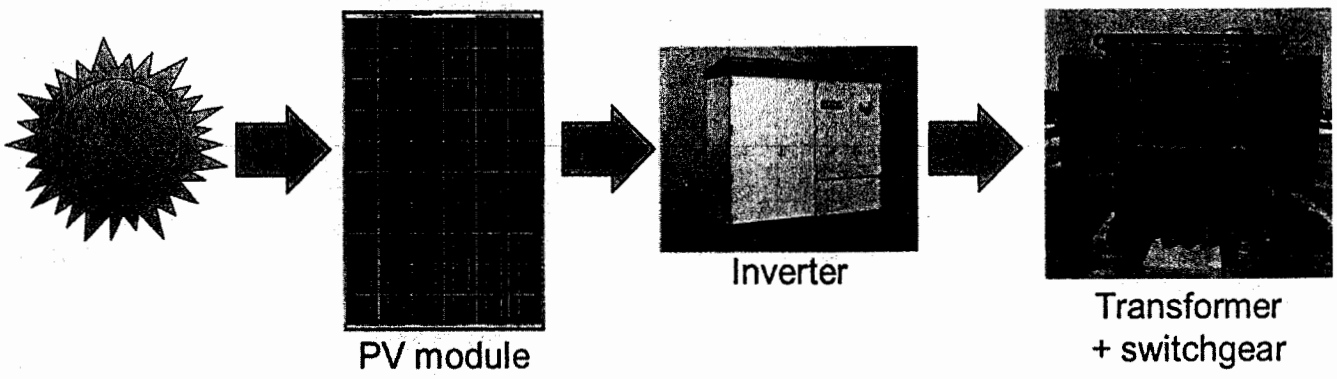
Location of the Solar Power Plant/Solar Farm of Zorlu Solar Pakistan (Pvt.) Limited (ZSPPL)

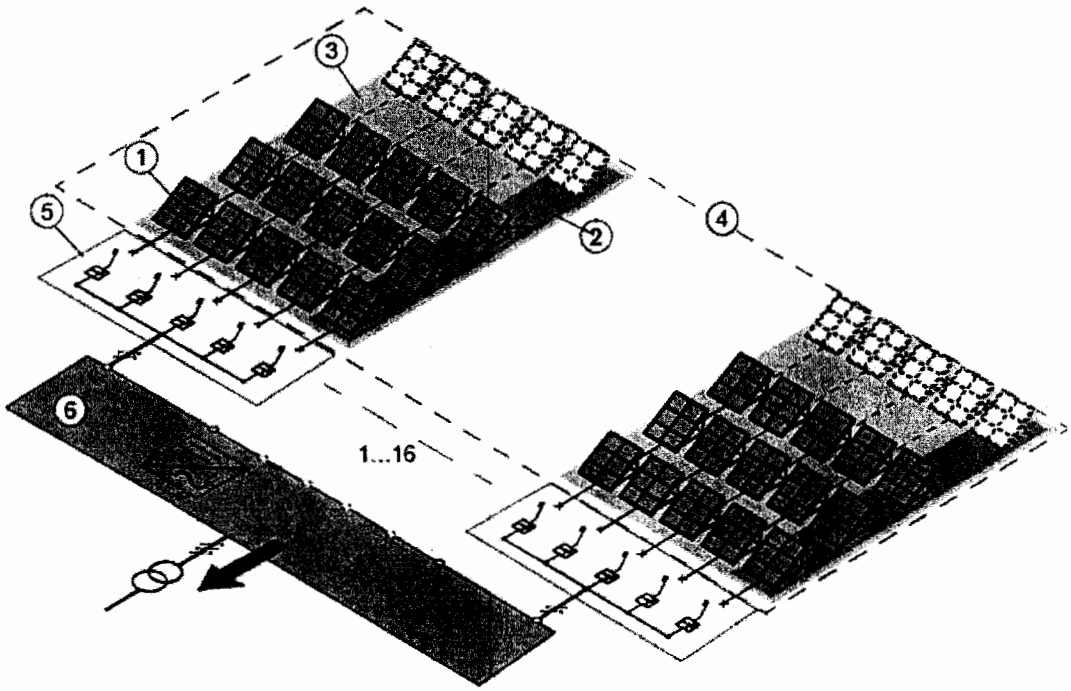


Land Coordinates of the Generation Facility/Solar Farm of ZSPPL

Total Project Land:500 Acres		
S. No.	**Latitude**	**Longitude**
Boundary 1	29°16'50.10"N	71°47'19.98"E
Boundary 2	29°16'50.10"N	71°48'22.08"E
Boundary 3	29°16'30.54"N	71°48'22.08"E
Boundary 4	29°16'30.54"N	71°48'9.66"E
Boundary 5	29°16'20.76"N	71°48'9.66"E
Boundary 6	29°16'20.76"N	71°47'57.24"E
Boundary 7	29°16'1.20"N	71°47'57.24"E
Boundary 8	29°16'1.20"N	71°47'13.98"E

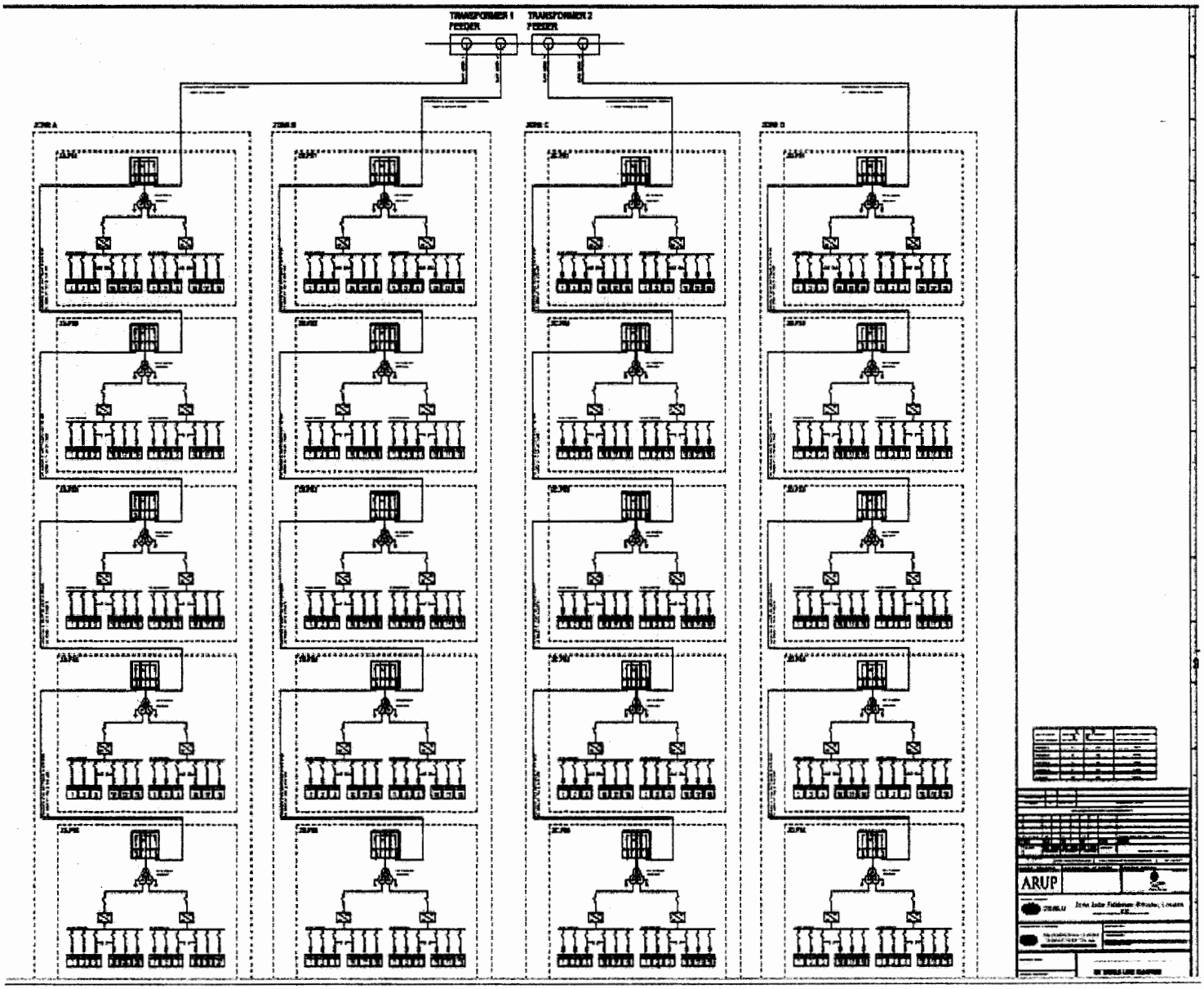
Process Flow Diagram of the Solar Power Plant/Solar Farm of ZSPPL





1	Solar module (photovoltaic module)	3	Solar array	5	Solar array junction box
2	Solar string	4	Solar generator	6	Inverter

Single Line Diagram (Electrical) of the Generation Facility/Solar Farm of ZSPPL



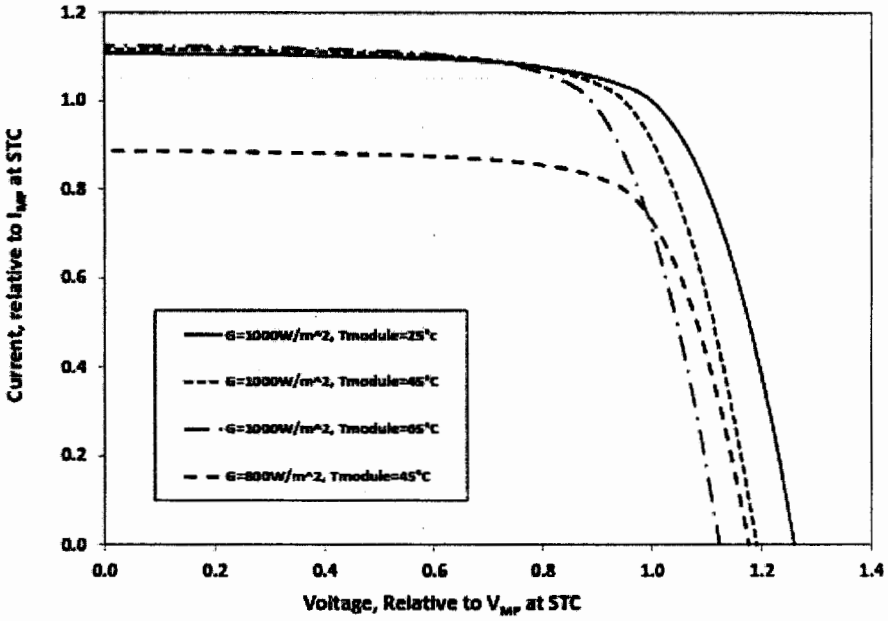
Interconnection Arrangement/Transmission Facilities for Dispersal of Power from the Generation Facility/Solar Farm of ZSPPL

The power generated from the generation facilities/solar farm of Pakistan Zorlu Solar Pakistan (Pvt.) Limited (ZSPPL) shall be dispersed to Lal-Sohanra 220/132 kV Substation

2. The proposed interconnection/dispersal arrangement for the project will be direct 132 kV double circuit from Zorlu Solar-I Power Plant to Lal Sohanra 220/132 kV substation. The distance of the site of solar plant from the grid station, as verified from site visit is approximately 2 km.

3. Any change in the above interconnection arrangement/transmission facility duly agreed by License/ZSPPL, NTDC and MEPCO will be communicated to the Authority in due course of time.

I-V Curve (Normalized) for FS Series-4 Modules



Detail of
Generation Facility/Solar Farm

(A). General Information

(i).	Name of Licensee	Zorlu Solar Pakistan (Pvt.) Limited
(ii).	Registered/ Business Office	C-117, Clifton Block-2, Karachi Pakistan.
(iii).	Location of the generation facility	Extension of Quaid-e-Azam Solar Park, in the Province of Punjab
(iv).	Type of generation facility	Solar Photovoltaic (PV)

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) Cell
(ii).	System Type	Grid Connected
(iii).	Installed Capacity of Solar Farm(MW)	100 MW

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	FS4112-3 [10.38 MW] FS4115-3 [76.64 MW] FS4117-3 [12.97 MW]
(ii).	Type of Cell	Cd-Te Thin Film
(iii).	Dimension of each Module	1200*600*6.8 mm
(iv).	No. of Panel /Modules	869,160
(v).	Module Area	0.72m^2
(vi).	Panel's Frame	None
(vii).	Weight of one Module	12 kg
(viii).	No of Solar Cells in each module	up to 216 cells
(ix).	Efficiency of module	FS4112-3 112.5 W (15.6 %) FS4115-3 115 W (16.0 %) FS4117-3 117.5 W (16.3 %)

(x).	Maximum Power (P_{max})	112.5 Wp 115 Wp 117.5 Wp	
(xi).	Voltage @ P_{max}	FS4112-3 = 68.5V FS4115-3 = 69.3V FS4117-3 = 70.1V	
(xii).	Current @ P_{max}	FS4112-3 = 1.64A FS4115-3 = 1.66A FS4117-3 = 1.68A	
(xiii).	Open circuit voltage (V_{oc})	FS4112-3 = 87.0V FS4115-3 = 87.6V FS4117-3 = 88.1V	
(xiv).	Short circuit current (I_{sc})	FS4112-3 = 1.83A FS4115-3 = 1.83A FS4117-3 = 1.83A	
(xv).	Maximum system open Circuit Voltage	1500 V	
(b).	**Inverters**		
(i).	Capacity of each unit	4000kW	
(ii).	Manufacturer	SIEMENS - WSTECH	
(iii).	Input Operating Voltage Range	836V-1500V	
(iv).	Number of Inverters	20	
(v).	Efficiency of inverter (EU)	98.5 %	
(vi).	Max. Allowable Input voltage	1500 V DC	
(vii).	Max. Current	4 x 1220 A	
(viii).	Max. Power Point Tracking Range	836 ~ 1500V	
(ix).	Output electrical system	3 phase, 3 wire	
(x).	Rated Output Voltage	550V	
(xi).	Power Factor (adjustable)	0 ~ 1 (leading & lagging)	
(xii).	Power control	MPP tracker	
(xiii).	Rated Frequency	50 Hz	
(xiv).	Environmental Enclosures	Relative Humidity	0~95%, non-condensing

		Audible Noise	< 55 dB(A)
		Operating Elevation	4500m (>3000m derating)
(xv).		Operating ambient temperature	-25°C~+60°C
(xvi).	Grid Operating protection	A	DC circuit breaker
		B	AC circuit breaker
		C	DC overload protection (Type 2)
		D	Overheat protection
		E	Grid monitoring
		F	Insulation monitoring
		G	Ground fault monitoring
(c).	**Junction Boxes Installed and fixed on main steel structure in Array yard.**		
(i).	Number of J/Box units	645	
(ii).	Input circuits in each box	13	
(iii).	Max. input current for each circuit	20A	
(iv).	Protection Level	IP65	
(v).	Over current protection	Fuse	
(vi).	Surge protection	Yes	
(d).	**Data Collecting System**		
(i).	System Data	Hardwire connection via RS485 and/or Ethernet.	
(e).	**Power Transformer**		
(i).	Rating	2x80/100 MVA	
(ii).	Type of transformer	ONAN/ONAF	
(iii).	Purpose of transformer	Step-up (33 kV/132 kV)	
(iv).	Output Voltage	132 kV	

(f).	**Unit Transformer**	
(i).	Rating	20×4000 kVA
(ii).	Type of transformer	33kV Oil Typed Transformer
(iii).	Purpose of transformer	Step-up (2x0.55kV/33kV)
(iv).	Output Voltage	33 KV

(D). Other Details

(i).	Project Commercial Operation date (COD)-Anticipated	March 31, 2018
(ii).	Expected Life of the Project from Commercial Operation date (COD)	25 years