INDRADHANUSH GAS GRID LIMITED
(Joint Venture of IOCL, ONGC, GAIL, OIL and NRL)
GUWAHATI, ASSAM

CORRIGENDUM # 2

FOR

SOLAR POWER SYSTEM FOR PIPELINE SECTIONS (1,2,3,4,5,6,7,8,9,12,13&14) UNDER NORTH EAST GAS GRID PIPELINE PROJET OF M/s IGGL

OPEN DOMESTIC COMPETITIVE BIDDING

Tender no.: 05/51/23VC/IGGL/078

Visit: www.tenderwizard.com/MECON
(**Tenderwizard helpdesk:** 011-49424365)

PREPARED AND ISSUED BY

MECON LIMITED
(A Govt. of India Undertaking)
Delhi, India

IGGL	CORRIGENDUM # 2 FOR SOLAR POWER SYSTEM FOR PIPELINE SECTIONS (1,2,3,4,5,6,7,8,9,12,13&14) UNDER NORTH EAST GAS GRID PIPELINE PROJET OF M/s IGGL Tender no. : 05/51/23VC/IGGL/078	MECON LIMITED
		Date: 22.04.2022

Sl. No.	Description	Volume	Page No.	Clause / Para / Section	Amendment / Addition / Modification / Deletion	
1	Scope of work	Vol-II of II	26 of 158 Para 10 & 11	Scope of Works AMC of CAMC for 5 year	Amendment	"UPS system shall be read as Solar system in Para 10 & 11".
2	Scope of work	Vol-II of II	26 of 158	Scope of Works AMC of CAMC for 5 year	Addition	Following clause is added to CAMC scope of work- "Quoted LS Prices for CAMC are applicable for all the stations & systems in the SOR (OFF GRID & ON GRID) and its further breakup shall be made for pro-rata basis (station wise) Payment as recommended and approved by MECON & IGGL. Accordingly, separate CAMC order shall be issued by M/s IGGL for individual stations."
3	Scope of work	Vol-II of II	34 of 158	Vendor data requirement	Amendment	In vendor data requirment sr no. 24 "Confirmation for Support & Availability of spares by OEM of MPPT Charger, FCBC Charger & Converter for 15 years from date of commissioning of the system" shall be read as "Confirmation undertaking from OEM that they shall provide support to the successful bidder during I&C & CAMC. Another undertaking by OEM for Availability of spares of MPPT Charger, FCBC Charger & Converter for 15 years from date of commissioning of the system".
4	Data sheet of SPV system	Vol-II of II	111 of 158	MEC/DS/05/E9/078	Amendment	Revised data sheets are attached as Annexure-I to this Corrigendum for DCDB feeder of 1400W & 2000W system.
5	Data sheets of FCBC Charger	Vol-II of II	127 of 158	1.3 (Page 3 of 5 doc no. MEC/DS/05/E9/28)	Amendment	Arrengement - "In 1x100%" shall be read as "2x100%".
6	Schematc Drawing	Vol-II of II	139 of 158	Schemtic Diagram	Amendment	Revised schematic diagram is attached as Annexure-II to thisCorrigendum.
7	Payment terms	Vol-I of II	289-291 of 304	Annex-5 to SCC	Amendment	Revised payment terms is attached as Annexure-III to this Corrigendum.

All other terms & conditions of tender document remain unaltered.

ANNEXURE-I TO CORRIGENDUM 2

DATA SHEET
FOR
SOLAR PHOTO VOLTAIC (SPV)
POWER SUPPLY SYSTEM

DATA SHEET NO. - MEC/DS/05/E9/078

(ELECTRICAL SECTION)
MECON LIMITED
DELHI 110 092

ANNEXURE – I

PURCHASER'S DATA FOR SOLAR PHOTO VOLTAIC (SPV) POWER SUPPLY SYSTEM

1.0	**SOLAR SYSTEM**	
1.1	Type	Solar Photovoltaic (SPV)
1.2	System/Application	Cathodic Protection (48 V DC), Instrumentation (24 V DC), SCADA (24 V DC) & Telecom (-48 V DC), F A & CO_2 flooding system (24 V DC)
1.3	Daily load demand of system	1400W & 2000W as per SOR
1.4	System rating (KWp)	As Per SOR
1.5	Earthing system	Two wire isolated system (No system Earthing provided for PV system), For -48V supply as per requirement.
1.6	Battery Back up	72 Hrs (3 Days Autonomy)
1.7	Location	**IGGL P/L Project**
1.8	Wind Velocity	Min 55 m/s or as Per Site Condition/Survey data. It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to MECON.
1.9	Ambient Temperature	Max. 50 deg C, Min 2 deg C
2.0	**SOLAR PANEL**	
2.1	Module output Watts (Wp)	≥200Wp
2.2	Insolation data	As per site condition, However average insolation value shall not be higher than 5.2 kWH/Sq.M/Day
2.3	Number of no sun days	03 days
2.4	Nominal voltage of solar array	96V DC
2.5	PV Array mounting	Structure mounting on roof/ground
2.6	De-rating Factors to be considered a) Solar array- (Module deterioration x dust deposit x Module mismatch x line resistance of cable x Array wiring x panel orientation x Rise in temp. x Charge controller eff.) c) Ageing factor	0.7

	b) DC-DC converter efficiency c) Battery Efficiency	0.80 0.80 0.9
2.7	Solar module framing material	Withstand up to Min 55 m/s wind velocity and Temp Range as specified.
2.8	Material of bird spikes	N/A
2.9	Degree of protection of Solar Array and junction box	IP65
2.10	Supporting structure	Anodized AL/Hot dipped Galvanized MS
2.11	Expected life span	20 years @ 80% of initial power rating
2.12	Structure Design	The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Necessary protection towards rusting need to be provided either by coating or anodization.
2.13	Fasteners	The fasteners used should be made up of stainless steel
3.0	**SOLAR CHARGE CONTROLLER-MPPT Charger**	
3.1	Type of charge Controller	Parallel Redundant (2x100%), Automatic changeover through static switch, MPPT type FCBC (Automatic & Manual Float cum Boost Charging) type
3.2	Enclosure degree of protection	IP 31
3.3	Mounting	Wall / floor
3.4	Cable entry	From Bottom
3.5	Rating (Amp)/KW	As per design calculation
3.6	Charger I/O	a) Transducer for telemetering battery voltage & current, load Voltage & current, solar array Voltage & current (4-20 mA Output) Compatible I/o for SCADA system b) Potential free contact & static switch- For deep discharge of battery bank (up to 70%) for annunciation through SCADA For status of charging of battery bank from Solar charge controller or grid charger through SCADA

		Various Fault Status Alarm for bank voltage becomes 88V DC (Adjustable). c) Interlocking logic between solar charger controller & FCBC Grid charger to enable automatic changeover as specification.
4.0	**415V 3x1 Ph FCBC CHARGER (Refer Charger Data sheet for more details)**	
4.1	Type of charger	DSP controlled PWM, FCBC (Automatic Float cum Boost Charging) type
4.2	Rating	As per design calculation @ C10 rating
4.3	Arrangement	As per drawing
4.3	Charger I/O	Potential free contact for charger 'ON' and available power supply Feedback for SCADA system and other as per charger specification a) Grid Supply of individual phases b) Charger ON/OFF c) I/P Current (R,Y,B) d) I/P Voltage (R,Y,B) e) O/P Current f) O/P Voltage g) Charger Fail
4.4	Output Voltage	96V DC/ As per design
4.5	Enclosure protection	IP 42
4.6	Mounting	Floor
4.7	Cable entry	From Bottom
4.8	Efficiency	>90% @ 100% load
4.9	Remote monitoring for all operating data of charger along with alarms on serial communication	RS485-ModBus protocol
5.0	**BATTERY BANK**	
5.1	Make	As per approved vendor
5.2	Type	Ni-Cd type battery bank
5.3	Mode of arrangement	2x50% (Provision made to isolate individual bank from Charge controller/grid charger for preventive maintenance) & Charging of individual battery bank from individual charger.

5.4	AH Rating	As per SOR
5.5	Self discharge of battery	<3% per month at 20 deg C <6% per month at 30 deg C
5.6	Battery Sizing: i) Battery end cell voltage (Min) ii) Battery De-rating factor to be considered: Aging Temp. Correction DOD (Depth of discharge) DC-DC conversion efficiency iii) Battery stand formation	1.1 V/Cell (As Calculated/ As per Manufacturer Standard) 0.8 As per min. site temp (0 deg C) 70% 80% Battery stands in double row/ double tier formation
5.7	Charge efficiency	>95% up to 70% state of charge
6.0	**DCDB**	
6.1	Type	Non draw-out type, Front operation & maintenance type with Voltmeter and Ammeter.
6.2	Degree of protection	IP 31
6.3	Mounting	Wall mounted
6.4	Cable entry	From bottom

5 (a)

1400W System-

DCDB (With suitable fuses)-24V

R3

1) No. of I/C feeder (DC MCB –DP 63A) - 2 No.

2) No. of O/G feeders

(DC MCB –DP 16A) - 5 No.

(DC MCB –DP 10A) - 5 No.

(DC MCB –DP 6A) - 3 No.

20% Spare Feeder to be provided.

DCDB (With suitable fuses)-48V

1) No. of I/C feeder (DC MCB –DP 20A) - 2 No.

2) No. of O/G feeders

(DC MCB –DP 16A) - 3 No.

(DC MCB –DP 10A) - 3 No.

(DC MCB –DP 6A) - 3 No.

20% Spare Feeder to be provided.

2000W System-

DCDB (With suitable fuses)-24V

1) No. of I/C feeder (DC MCB –DP 63A) - 2 No.

2) No. of O/G feeders

(DC MCB –DP 20A) - 2 No.

(DC MCB –DP 16A) - 4 No.

(DC MCB –DP 10A) - 5 No.

(DC MCB –DP 6A) - 3 No.

20% Spare Feeder to be provided.

DCDB (With suitable fuses)-48V

1) No. of I/C feeder (DC MCB –DP 32A) - 2 No.

2) No. of O/G feeders

(DC MCB –DP 16A) - 4 No.

(DC MCB –DP 10A) - 5 No.

(DC MCB –DP 6A) - 3 No.

20% Spare Feeder to be provided.

7.0	**PCU (MMPT-Inverter)**	
7.1	Switching Device	IGBT/MOSFET
7.2	Applicable standards	Applicable IEC/BIS
7.3	Control	DSP type, Dual MPPT PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown
7.4	AC Output Voltage	415V AC +/- 2% (Range 320-480V), Pure sine wave
7.5	Operating voltage range	+/-20%
7.6	Output Frequency	50 Hz
7.7	Operating frequency range	47-53 Hz
7.8	Enclosure Protection	IP-65 for Outdoor IP-42 for Indoor
7.9	Full Load THD	< 3%
7.10	Power factor (adjustable)	+/-0.8
	Efficiency	
7.11	Peak Efficiency	Min 98%
7.12	EURO Efficiency	Min 97%
7.13	No Load Loss	Less than 1% of rated power
7.14	Remote Monitoring	Built-in meter and data logger to monitor plant performance through external computer/Laptop shall be provided.
7.15	Display/User interface	LCD
8.0	**JUNCTION BOXES**	
8.1	Type	FRP/Thermo Plastic, Dust vermin and water proof
8.2	Degree of protection	IP65
8.3	Mode of arrangement	Sub array JBs than Main JB with facility for test point for quick fault location
9.0	**DC-DC CONVERTER (24V & 48V)**	
9.1	Type	Each convertor shall be parallel redundant (2x100%) with Galvanic Isolation
9.2	Input Voltage	85-135V DC (As per design)

9.3	Output voltage	24V DC & (+)48V-0V-(-) 48V
9.4	Accuracy	+/-1%
9.5	Efficiency	>90%
10.0	**SOLAR STREET LIGHTING SYSTEM**	
10.1	Type	Stand alone, Dusk-Dawn type
10.2	PV Module	150 Wp
10.3	Lamp	20 W LED (As per SOR)
10.4	Voltage	50-60 V AC
10.5	Battery Rating	150 Ah (3 Day Autonomy) (2x75AH arrangement)
10.6	Battery Type	Tubular Low maintenance type lead acid for solar application
10.7	Indications	Green LED-Charging in progress Red LED- For deep discharge
11.0	**CABLE AND ACCESSORIES**	
11.1	Interconnecting Cables Type	Cu- conductor XLPE Insulated, PVC sheathed, armoured/unarmoured FRLS type
11.2	Cable gland type	Double compression type
11.3	Lugs-type	Tinned Cu
11.4	Other accessories	As required
12.0	**SPACE AVAILABLE FOR MOUNTING OF SOLAR ARRAY IN EACH EXISTING TERMINAL**	
12.1	On Building top	----------
12.2	On ground	----------
13.2	Total plot size	SV station-45mx45m, IP station-75mx75m

ANNEXURE – II

TECHNICAL DATA FOR SPV POWER SUPPLY SYSTEM
(To be submitted up by the successful bidder)

1.0	**SOLAR ARRAY**	
1.1	Manufacturer's Ref. No./ Model No.	
1.2	Size of solar system	**Sizing calculation after award of bid**
1.3	No. of Solar panel/array	**Sizing calculation after award of bid**
1.4	Applicable codes/standards	
1.5	Steady state output volt	
1.6	Mode of Arrangement	
1.7	Peak power output of each module (Pmax, Watts)	
1.8	Current at Pmax (Imax)	
1.9	Voltage at Pmax (Vmax)	
1.10	Short circuit current (Isc)	
1.11	Open circuit voltage (Voc)	
1.12	Dimensions (in mm)	
1.13	Degree of protection of the panel.	
1.10	Tilt factor	
1.11	Loss factor	
1.12	Efficiency at 100% load	
1.13	Type of control circuit	
1.14	No. of days autonomy	**72 Hrs (3 Days autonomy)**
1.15	Total space requirement of the Arrays (Sq-m)	
2.0	**CHARGE CONTROLLER-MMPT**	
2.1	Rating (Amp.) / kW	**Sizing calculation after award of bid**
2.2	Output voltage under float/boost charging condition	
2.3	Type / Mode **Refer Block Diag. No. MEC/SD/05/E9/E/078/01 & 02**	**DSP type PWM Charger**
3.0	**GRID CHARGER (415V, 3x1Ph)**	

3.1	Rating (Amp.)/KW	**Sizing calculation after award of bid**
3.2	Output volt under float/boost charging condition	
3.3	Type/Mode	
3.4	Interlocking with SPV charge controller	
4.0	**BATTERY**	
4.1	Make	
4.2	Type (Enclose catalogue)	Ni-Cd
4.3	Type of construction	
4.4	AH rating	**Sizing calculation after award of bid**
4.5	Battery charge eff.	
4.6	Mode of arrangement	2X50%
4.7	Nominal cell voltage	1.2 V / Cell
4.8	End cell volt. At specified discharge rate (V/ cell)	
4.9	No. of cells	
4.10	Recommended Float charging voltage per cell	
4.11	Maximum Float charging voltage per cell	
4.12	Recommended Boost charging voltage per cell	
4.13	Maximum Boost charging voltage per cell	
4.14	Accessories for battery	Included.
4.15	Dimension of battery bank stand (WXDXH)	
5.0	**INDICATIONS AND ALARM**	
5.1	**METERING & INDICATION–** i) Voltage and Current from Solar Array. ii) Load Voltage and current iii) Battery current and voltage with indication of status – “in charge” or “discharge”. iv) Solar array Voltage and Current. v) Annunciation for battery deep discharge of battery. vi) Indication for charging of battery from solar charge controller or grid charger	

5.2	Confirmation on Remote Monitoring of the solar system through SCADA as per specification (Protocol shall be ModBus).	
6.0	**DIMENSIONS FOR EACH SYSTEM**	
6.1	Solar Array	
6.2	Battery Bank	
6.3	Charge Controller	
6.4	3x1Ph Grid Charger-FCBC	
7.0	**PCU/Inverter**	
7.1	Manufacturer Name	
7.2	Model No.	
7.3	Rating	
7.4	Peak Eff.	
7.5	Euro Eff.	
7.6	Degree of Protection	
7.7	Remote Monitoring	
7.8	Make of Laptop with software supplied with the PCU	
7.9	Nos. of MPPT	

ANNEXURE – III

TECHNICAL DATA FOR SOLAR STREET LIGHITING SYSTEM
(To be submitted up by the successful bidder)

1.0	**SOLAR MODULE**	
1.1	Peak Power (Wp)	
1.2	Peak Voltage	
1.3	Peak Current	
1.4	Open Circuit Voltage	
1.5	Short Circuit Current	
1.6	Nominal Voltage	
2.0	**BATTERY**	
2.1	Make	
2.2	Type	
2.3	Ah rating	
2.4	System Autonomy	
2.5	Nominal Voltage	
2.6	Depth of discharge	
3.0	**LUMINARY ASSEMBLY**	
3.1	Type of lamp	
3.2	Luminous Efficiency	
4.0	**DIMENSIONS:** (Enclose Catalogue**)**	

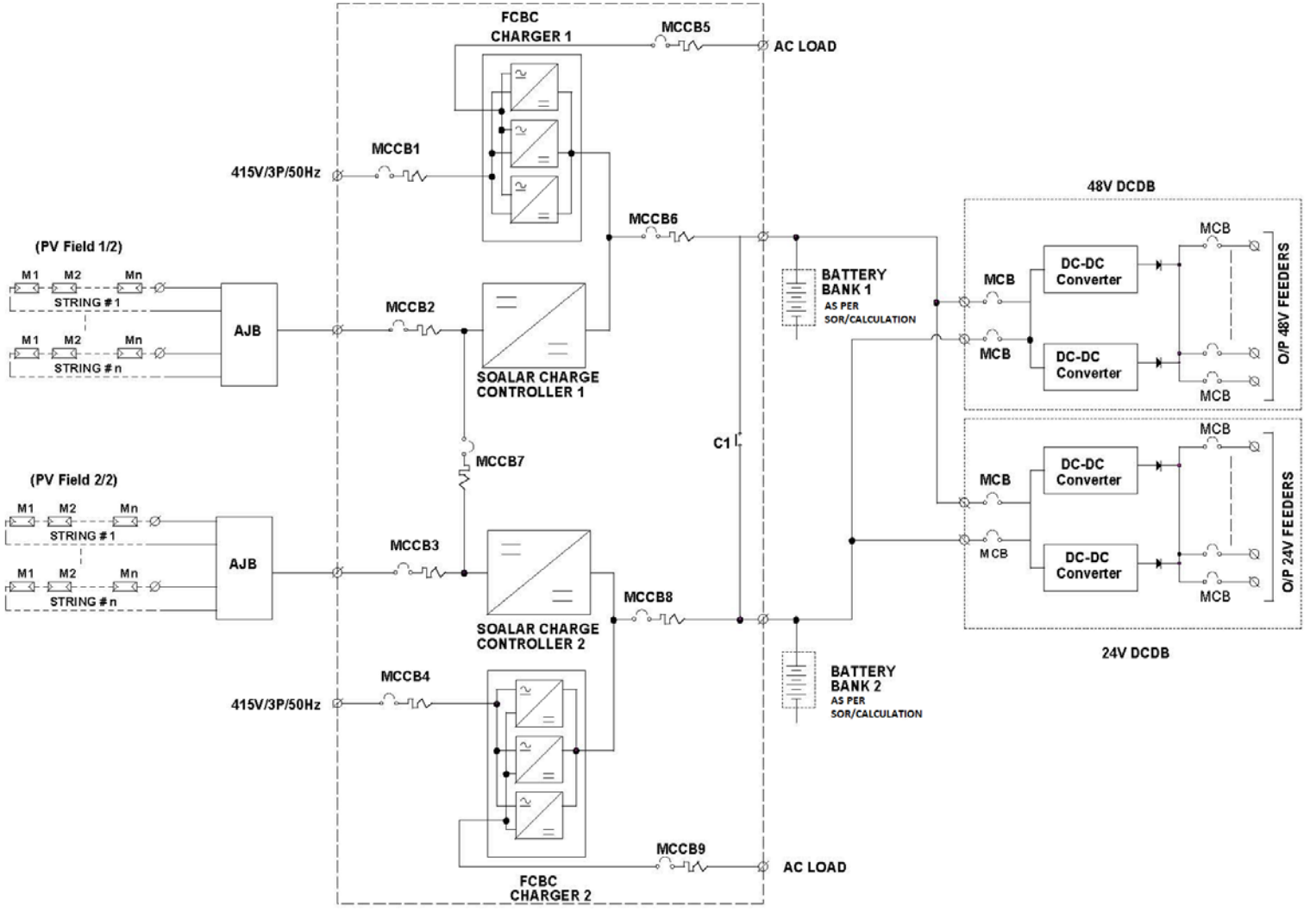
ANNEXURE – IV

CHECK LIST (To be submitted by the Bidder)

Sl. No	Description	Remarks
1	Deviation from specification	Offer may be rejected if there is any deviation
2	Solar Array sizing calculation enclosed	After award
3	Charger sizing calculation enclosed (both solar and grid charger)	After award
4	Battery sizing calculation enclosed	After award
5	PCU Model no. & Rating	After award
6	PCU Sizing calculation	After award
7	List of spares, tools & tackles for PCU system.	Yes/No
7	Solar Array, Battery catalogue enclosed	Yes/No
8	Confirmation for Inspection of Solar Array, charge controller, PCU and battery as per Specification/QAP.	Yes/No
9	Confirmation for Remote monitoring of the parameters through SCADA system (Hook-up with Owner's SCADA system through RS232/485) and automatic changeover between grid charger & solar Charger.	Yes/No
10	Confirmation that Solar System Offered can be accommodated in plot area (Refer enclosed plot plan).	Yes/No
11	Confirmation on Dimension of Solar Array, Charge Controller, 3Ph Charger and Battery Bank as per the available space and can be accommodated in the available space in electrical room.	Yes/No
12	Unpriced schedule of rate (SOR) enclosed.	Yes/No
13	Confirmation on submission of design on PVSyst. Bidder shall have valid Licence for the same. (Submit the details along with Bid)	Yes/No
14	Guaranteed Energy Generation For 25 Years (year-wise) of 20kWp On-grid system.	Yes/No

ANNEXURE-II TO CORRIGENDUM 2

BLOCK SCHEMATIC OF SOLAR POWER SYSTEM WITH GRID CHARGER & MPPT CHARGER



ANNEXURE-III TO CORRIGENDUM 2

ANNEXURE-5 TO SCC (REVISED)

TERMS OF PAYMENT

1.0 PAYMENT TERMS

1.1 **Item include only Supplies**

1.1.1 75 % Pro-rata for supply portion as per approved Billing Schedule on submission of Invoice in triplicate with following document:

i) Original LR / GR as applicable
ii) Packing List.
iii) Inspection release note/ Inspection certificate/ Dispatch instructions issued by Owner / Consultant
iv) Proof of customs clearance including payment of customs duty (if applicable).
v) Indemnity Bond equivalent to invoice value
vi) Receipt and acceptance of all material designated store at site on submission of Goods Receipt Voucher (GRV) & Certificate for receipt of all Goods as per PO issued by Purchaser/Consultant/ Engineer – in -Charge (EIC) at site.
vii) The material shall be checked as per the packing list of the vendor without opening of the boxes for physical verification jointly verified by Purchaser/Consultant)

1.1.3 10% on Completion of Installation of individual item on submission of invoice in triplicate with following document:

i) Certificate from Owner / Consultant for successful installation.

1.1.4 5% on Completion of testing and commissioning of individual item on submission of invoice in triplicate with following document:

i) Certificate from Owner and Consultant for successful testing, commissioning.

1.1.5 10% of total supply portion on final acceptance and handing over the SPV Power system on submission of invoice in triplicate with following document:

i) Certificate from Owner for Handing and acceptance over of SPV Power system.
ii) Certificate from Owner / Consultant for receipt of all requisite documents such as (i) warranty certificate; (ii) as built drawings; (iii) test reports; (iv) reconlisation statement etc.

1.2 For Work Portion/ I& C

1.1.1 60 % progressive monthly payment on submission of invoice in triplicate with following documents:

i) Invoice covering PRS, if applicable
ii) Certificate from Owner / Consultant for completion of installation of SPV power system.

1.1.2 30 % progressive monthly payment on submission of invoice in triplicate with following documents:

i) Invoice covering PRS, if applicable
ii) Certificate from Owner / Consultant for completion of testing and commissioning of SPV power system.

1.1.3 10% of total supply portion on final acceptance and handing over the SPV Power system on submission of invoice in triplicate with following document:
i) Certificate from Owner for Handing and acceptance over of SPV Power system.

ii) Certificate from Owner / Consultant for receipt of all requisite documents such as (i) warranty certificate; (ii) as built drawings; (iii) test reports; (iv) reconlisation statement etc.

1.3 <u>Other items not covered above or elsewhere in the tender (For only supply of O&M spare's)</u>

a) Completion supply of individual item of work as per SOR including supplies wherever involved on submission of following documents. : 90%

1. LR or GR (original)
2. Packing List.
3. Inspection release note/ Inspection certificate/ Dispatch instructions issued by Owner / Consultant
4. Proof of customs clearance including payment of customs duty for imports permitted in the Contract, if applicable.
5. Receipt and acceptance of all material designated store at site on submission of Goods Receipt Voucher (GRV) & Certificate for receipt of all Goods as per PO issued by Purchaser/Consultant/ Engineer – in -Charge (EIC) at site.
6. The material shall be checked as per the packing list of the vendor without opening of the boxes for physical verification jointly verified by Purchaser/Consultant).

b) 10% on completion of all activities and their acceptance from owner, submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order. : 10%

1.4 <u>Payment terms for extended storage</u>

100% on submission of Bills by Vendor on monthly basis duly certified by Engineer-in-Charge/Purchaser.

1.5 <u>For Lumpsum Items</u>

For all lumpsum items included in schedule of rates, contractor shall furnish price break-up for quoted lumpsum prices for the approval of Engineer-in-charge. Payment for such item shall be made accordingly. In this regard decision of Engineer-in-charge shall be final and binding to the bidder.

1.6 <u>For CAMC-</u> Annual Maintenance of the Solar PV system (Comprehensive Annual Maintenance Contract-CAMC)

a. The composite rate quoted by vendor for 5 years CAMC period shall be split year wise in the following percentage for payment purpose

Year 1 : 10% of CAMC cost of 5 years

Year 2 : 15% of CAMC cost of 5 years

Year 3 : 20% of CAMC cost of 5 years

Year 4 : 25% of CAMC cost of 5 years

Year 5 : 30% of CAMC cost of 5 years

a. Quarterly Payments will be made for AMC contracts. Liquidated damages shall be applicable as per the CAMC clause and summarized below

Note: Any further breakup of each activity for the payment purpose can be done depending upon the site situation/requirement and Recommendation by Engineer – In-Charge and approval of Construction-In-Charge.

5.0 PAYMENT METHODOLOGY

5.1 IGGL has introduced the computerized Bill Watch system whereby the contractor will be issued a receipt at the time of the submission of the bills. The contractor can see the status of their bill on IGGL's website.

Employer will release payment through e-payments only as detailed in the Bidding Document.

5.2 Further break-up of Lumpsum Prices, if deemed necessary for any progressive payment of individual item may be mutually arrived at between Engineer-in-Charge and the Contractor.

5.3 All payments against running bills are advance against the work and shall not be taken as final acceptance of work / measurement carried out till the final bill.

6.0 DEDUCTION AT SOURCE

Owner will release the payment after off-setting all dues to the owner payable by the contract under the contract. Deduction will be effected at source as per the law in force.