

# **ASSAM POWER GENERATION CORPORATION LIMITED**



## **TENDER DOCUMENT FOR**

**Providing Consultancy Services (preparation of bid document for selection of EPC contractor, Evaluation of Bid, Award of EPC contract and Project Management Construction & Supervision services) for setting up of a grid connected 69 MW Solar Photo-Voltaic Power Project at Amguri, Sivasagar, Assam, India**

### **OFFICE OF THE CHIEF GENERAL MANAGER / CONTRACTS**

**Regd. Office: 3<sup>rd</sup> floor, Bijulee Bhawan, Paltanbazar, Guwahati-781 001, Assam**

**CIN: U40101AS2003SGC007239 Tele-Fax: 0361-2739546;**

**E-mail: [cgm-g@apgcl.com](mailto:cgm-g@apgcl.com), Website: [www.apgcl.org](http://www.apgcl.org)**

**Tender No: APGCL/CGM (G)/Amguri SPV Projects/Tender/2017**

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**SECTION – I**  
**INVITATION TO BID**

**Project Consultancy Services for Grid Connected 69 MW solar PV power Project at Amguri,  
Sivasagar, Assam, India**

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**SECTION -I**

**INVITATION TO BID**

**NIT REF. APGCL/CGM (G)/ Anguri SPV Projects/ Tender/2017 dtd: 18.01.2017**

Assam Power Generation Corporation Limited (APGCL) intends to set up of a Grid connected 69MW Solar Photovoltaic Power project at Amguri, Sivasagar District in the State of Assam. APGCL invites sealed bids from reputed firms, having requisite qualification & experience, to carry out Project Consultancy services like preparation of Bid document for selection of EPC contractor, bid evaluation, project Management Construction & Supervision etc for the proposed project.

**Cost of Tender document: Rs.2000/-**(Rupees Two thousand only) (Non refundable)

**Earnest Money Deposit (EMD): Rs.100000/-** (Rupees One lac only).

The cost of Bid Document and EMD shall be submitted in the form of Demand draft from a Nationalized/ Scheduled bank to be pledged in favour of Dy. General Manager (F&A), Assam Power Generation Corporation Limited payable at Guwahati.

APGCL reserved the right to accept or reject any bid in part or in full or cancel/ withdraw the notice inviting tender(bid) without assigning any reasons there of whatsoever and is not bound to accept the lowest bidder and in such case, no Bidder/ intending Bidder shall have any claim arising out of such action.

<b>Bid sale period:</b>	<b>From 21.01.2017 to 11.02.2017</b>
<b>Pre bid discussion:</b>	<b>On 30.01.2017 at 11:30 IST at APGCL head Office</b>
<b>Last date and time for receipt of bid:</b>	<b>Upto 13.02.2017 at 13:00 Hrs IST.</b>
<b>Date and time of Technical bid opening:</b>	<b>On 13.02.2017 at 14:00 Hrs IST.</b>
<b>Date of opening of price bids:</b>	<b>To be intimated later</b>

The details of the bid is available on APGCL website: [www.apgcl.org](http://www.apgcl.org)

Address:

The Chief General Manager (Generation)  
Assam Power Generation Corporation Limited  
3<sup>rd</sup> floor, Bijulee Bhawan, Paltanbazar,  
Guwahati-781 001, Assam  
Tele-Fax: 0361-2739546;  
E-mail: [cgm-g@apgcl.com](mailto:cgm-g@apgcl.com)

*21.01.17*

Chief General Manager (Generation),  
APGCL

*AI*

## **1.2 SCOPE OF CONTRACT:**

The total consultancy contract shall be executed in two phases, viz. Phase-I and Phase-II.

**Phase-I scope of works** covered under 'Consultancy Services' is briefly outlined below.

- Basic Design & Engineering (preparation of bid document i.e. RFP).
- Evaluation of Bids.
- Vendor selection (upto award of EPC contract).

**Phase-II scope of works** covered under 'Consultancy Services' is briefly outlined below.

- Review & approval of vendor drawings/documents
- Project Management Services.
- Field Services at site (Assistance in construction supervision, startup, testing & commissioning)

The detailed scope of works is covered in **SECTION-III**.

The bidder shall submit his offer covering the entire scope of works mentioned in the tender documents. Offer submitted with part scope will be liable for rejection.

**The consultancy services are divided into two parts phase I and Phase II. .APGCL may issue a single work order or two separate work orders for the respective parts and reserves the right to withhold work order for any or both the parts at any time before or after finalization of bids without showing any reasons thereof.**

## **1.3 PERIOD OF CONSULTANCY CONTRACT:**

The Period of Consultancy services Contract is **17 months** (tentative) for executing both of Phase I & Phase II services.

1. The time schedule for Phase-I scope of Consultancy services (upto Award of EPC Contract) from the date of LOA to Consultant will be as follows:
  - a. 1 months for submission of final draft tender specifications-draft RFP (tentative).
  - b. 4 months for vendor selection (award of EPC contract) (tentative).
2. The time schedule for completion of Phase-II scope of consultancy services from the date of effective date of the project is 12 months (tentative).

## **1.4 QUALIFYING REQUIREMENTS:**

### **1.4.1: General**

The firm shall meet the qualifying requirements as stipulated hereunder

The firm should be a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto, engaged in the business of Power/Infrastructure. A copy

of certificate of incorporation, Memorandum of Association & Article of Association shall be furnished along with the bid in support of above. Firm's participation in the form of JV/Consortium will not be allowed. The firm must be empanelled with NISE, Govt. of India.

**1.4.2 Technical Eligibility Criteria:**

The bidder should have executed Engineering consultancy services (scope including preparation of tender specifications, tendering assistance, review of engineering drawings / documents, supervision of erection & commissioning etc) for solar power plants of cumulative installed capacity of **100 MW and above in India**, out of which one **solar power project should be not less than 50MW** capacity and which should have been commissioned as on the original scheduled date of bid opening.

**1.4.3 Financial Eligibility Criteria:**

The minimum average annual turnover of the Bidder in the preceding any one of the last three (3) financial years as on the date of Technical bid opening, shall be following: INR 40 Lakh (Indian Rupees forty lakh only) or in equivalent foreign currency (Bills Clearing (B.C.) Selling Market Rate of Exchange (MRE) of the foreign currency as established by State Bank of India, prevalent as on 30 days prior to the date set for bid opening).

**1.5 DOCUMENTARY EVIDENCE REQUIRED IN SUPPORT OF QUALIFYING REQUIREMENTS**

1.5.1 The bidder should enclose with his bid necessary documentary evidences (as specified at annexure-I) for having met the relevant qualifying requirements mentioned in clauses 1.4.1 above as applicable.

**1.6 OTHER CONDITIONS**

1.6.1 The successful bidder on award of LOA shall furnish a contract performance guarantee in the form of an On Demand Bank Guarantee valid till the completion of all the obligations under the contract as follows.

1.6.1.1 The bidder meeting the qualifying requirement in clause 1.4.1 shall furnish a contract performance guarantee for 10% of the total contract value.

1.6.2 The scope of work of the consultant shall be on the basis of single bidder responsibility. The contract will be entered into only with the successful bidder. Thus the bidder shall be solely responsible and liable for all the Technical, Management and all other services required, to complete the entire scope of work detailed in the tender specification.

- 1.6.3 The requirement of documentary evidence called for in Qualifying Requirements is indicated at Annexure-I. The bidder shall comply with these requirements.
- 1.6.4 The bidder shall furnish the following details also along with offer.
- 1.6.4.1 Contracts in hand and their status along with value.
- 1.6.4.2 Major legal cases and their statutory liabilities.
- 1.6.4.3 Recent orders for consultancy services for solar power project not less than 50 MW with contract value.
- 1.6.5 The bidder cannot be an associate of other bidders who are bidding for this consultancy services tender.
- 1.6.6 The bidder who has been engaged to provide goods or works for the project and any of its affiliates will be disqualified from providing consultancy services for the same project. Conversely the bidder engaged to provide consultancy services for the project and any of its affiliates will be disqualified subsequently from participating in any of the tenders for providing goods or works or services related to the same project. As a standard practice, the bidder who becomes Consultant for this project cannot become a contractor for any work of this project.
- 1.6.7 The bidder should not sub-contract the work back to back.
- 1.6.8 Notwithstanding anything stated above, the Employer reserves the right to verify all statements / information submitted by the bidder to confirm the bidder's claim on experiences and to assess the bidder's capability and capacity to perform the contract should the circumstances warrant such an assessment in the overall interest of the project.
- 1.6.9 In case certificate(s) submitted by the bidder is found to be a forged one / bogus one, the bidder will not only be disqualified for the tender but also would be blacklisted / debarred by the Employer and the matter would be informed to other PSUs / Statutory Bodies and in addition, forfeiture of EMD may also be considered.
- 1.6.10 Employer reserves the right to accept or reject any or all offers or cancel / withdraw the invitation for consultancy services without assigning any reason whatsoever and in such case no bidder / intending bidder shall have any claim arising out of such action.
- 1.7 Tender documents, not transferable, will be available at the Corporate Office of The Chief General Manager (Gen), APGCL, 3rd floor, Bijulee Bhawan, Paltan Bazar, Guwahati-781001, Assam on payment of INR 2000/- in the form of a/c payee Demand Draft/ Banker's cheque duly pledged which is not refundable, drawn in favour of the Dy. General**

**Manager (F&A), APGCL, payable at Guwahati-781001.** The forwarding letter should bear the tender No. and should be addressed to:

The Chief General Manager (Gen),  
APGCL, 3rd floor, Bijulee Bhawan,  
Paltan Bazar, Guwahati-781001

- 1.7.1 The Notice Inviting Tender (NIT) and the tender document has been posted in APGCL web-site [www.apgcl.org](http://www.apgcl.org). Please log on to our web site [www.apgcl.org](http://www.apgcl.org) for detailed NIT and Qualifying Requirements and Tender document.
- 1.7.2 The Tender document may also be downloaded from our website [www.apgcl.org](http://www.apgcl.org) in which case, the cost of Tender Document **INR 2000/-shall be paid by way of DD drawn in favour the Dy. General Manager (F&A), APGCL, payable at Guwahati-781001** and the DD shall be enclosed with the bid in Envelope- I, failing which, the offer is liable for rejection.
- 1.8 Earnest Money Deposit (EMD) as well as technical & commercial aspects**
- 1.8.1 Earnest Money Deposit (EMD) shall be submitted along with the bid in a separate sealed cover indicating the tender number and the name of the bidder distinctly on top.
- 1.8.2 No interest shall be paid on Earnest Money Deposit (EMD amount. The bid without EMD or with short EMD or EMD in the form other than specified herein above shall be liable for rejection.
- 1.8.3 The EMD shall be forfeited if:
- The bidder withdraws / modifies / changes / impairs / derogates the bid proposals on his own after the bids are opened and during its validity period.
  - The prices are altered unilaterally by the bidder after the bid opening and during validity of offer.
  - The Owner accepts the bidder's bid proposal and the bidder refuses to accept the LOA / refuses to enter into Contract after the LOA is awarded to him.
  - The successful bidder fails to submit Contract Performance Guarantee.
  - The bidder submits forged / bogus certificates.
- 1.8.4 The EMD of successful bidder will be returned after acceptance of LOA by the bidder and acceptance of Contract Performance Guarantee by APGCL. The EMD of unsuccessful bidder(s) will be returned after the price cover opening and Price evaluation.
- 1.8.5 Unless otherwise expressly stated, the bid and other documents shall be submitted only by the bidder on whose name the tender document has been purchased.



## **1.9 BID SUBMISSION AND OPENING**

### **1.9.1 Procedure for Submission of Bids**

The Bid shall be submitted in three separate sealed envelopes enclosed in one sealed cover. Sealed cover and envelopes should be inscribed with

1. The NIT no.
  2. Content of the envelop.
  3. Address of the Employer.
  4. Date and time of opening of tender.
  5. Address of the bidder.
- Envelop-I shall contain the Bid Guarantee (earnest money deposit) and the cost of Tender Document.
  - Envelop-II Shall contain technical bid in triplicate with the original marked as "Original".
  - Envelop-III Shall contain the price bid in triplicate with the original marked as "Original".
  - The above three envelopes shall be sealed and inscribed with NIT number and address of Employer and bidder must be enclosed together in a sealed cover inscribed with the above and delivered by hand or sent by "Registered Post with Acknowledgment Due"/ "Reputed Courier Service" to the Employer to reach him on or before 13.02.2017 at 13:00 Hrs.
  - All pages of the Bid and other accompanying documents shall be signed with seal at the lower right hand corner with date by the Bidder or any person authorized by the bidder.
  - No overwriting shall be allowed. Any writing requiring correction shall be struck out and signed. No correcting ink shall be used.
  - Any Bid which is incomplete, ambiguous, or not in compliance with the Bid Document is liable to be rejected.
  - Envelop -I containing Earnest Money Deposit (EMD) and cost of bid document will be opened first, on the date, time and place as specified in the Notice Inviting Tender (NIT) in presence of Bidders or their representatives.
  - If the amount and mode of EMD and cost of bid document submitted satisfy the requirements of Employer then the Envelop-II will be opened.
  - Envelop-III containing price offer of the technically accepted Bidders will be opened at a later date with prior intimation only to those Bidders whose Tenders are being considered.
  - Price shall be quoted showing taxes and duties if any.

All bids shall be prepared in ENGLISH language only by typing or printing with indelible ink. One original and three identical copies of the proposal complete in all

respects shall be submitted by the Bidder clearly indicating the original and the number of the copy. Bids must be received / deposited / delivered by not later than 13:00 Hrs. IST on the date fixed for the bid opening. Bids deposited / delivered after the time & date fixed for the receipt of the bids shall be rejected.

The following APGCL officials may be contacted for any communication

J. Sarma, Deputy General Manager (Project), APGCL- M No. +91-9435332156

A. Talukdar, Asstt. General Manager (Design), APGCL- M No. +91-9435139416

Bids received in incomplete shape shall be summarily rejected. The bidder's name stated in the bid shall be the exact legal name of the bidder. Satisfactory evidences of authority of a person signing on behalf of the bidder shall be furnished with the bid. Erasures or corrections or overwriting in the bid documents, if any, shall be initialed by the person signing the bid. Printed literature, if enclosed, need not be signed.

- 1.9.2 APGCL takes no responsibility for delay, loss or non-receipt of any letters / documents sent by post either way and APGCL reserves the right to reject any bid in part or in full without assigning any reason thereof.
- 1.9.3 The Bids submitted by tele-fax / E-mail will not be accepted.
- 1.9.4 Reference list, self-certificate or other unauthenticated documents and documents in plain white sheets will not be considered as valid QR documentary evidence. The Employer reserves his right to call for the original of the certificates, documents, furnished by the bidder for verification.
- 1.9.5 Validity of Bid:  
Bid shall be kept valid for a period of 180 days from the date of bid opening.
- 1.9.6 The date of opening of Envelope III of the bid (price cover) will be intimated later to the bidders who have been techno-commercially qualified.
- 1.9.7 Bidders may depute their representatives (maximum two) with authorization letter to attend the technical bid opening and price bid opening.

#### **1.10 EVALUATION AND COMPARISON OF BIDS:**

- 1.10.1 The bidder has to satisfy himself that full information is furnished as required in the specification. Lack of particulars or incomplete information furnished will run the risk of rejection of the bid.
- 1.10.2 All the bidders would be brought on par with reference to commercial and technical specification, Notice Inviting Bid and subsequent techno-commercial discussions / clarifications.

- 1.10.3 The bids received and accepted will be evaluated by the Employer to ascertain the most suitable evaluated bid in the interest of Employer, for the complete works covered under the specifications and documents.
- 1.10.4 The bids will be evaluated by taking into account the Total value of both the Phases (i.e. Phase-I and Phase-II) only.
- 1.10.5 Scope of consultancy contract works of Phase-I can be short-closed at any stage, Payments will be made only to the completed job as per the payment schedule.
- 1.10.6 If there is any discrepancy between the figures & words, the value quoted in words shall prevail.
- 1.10.7 The bidder shall quote for all services against all the Sl. Nos. and Columns in the “Schedule of Prices. If no prices are envisaged for any of the item, “Nil” shall be mentioned. In this context, ‘Nil’ mentioned against any item shall construe that bidder shall not charge any amount separately for that item from the Employer and agrees to execute the works as per specification.
- 1.10.8 If the term, such as, ‘-’, is mentioned or left blank against any Sl. Nos. / Columns, then the highest amount quoted for the concerned item among all bidders will be loaded for the purpose of evaluating the price bids. However this loading concept shall not be applicable for taxes & duties if the bidder indicates terms like “-“ or left blank against the taxes & duties and in such cases, the taxes & duties if any applicable shall be borne by the bidder.

### **1.11 SIGNING OF CONTRACT**

- 1.11.1 The enclosed Tender specification shall form the basis of the final contract to be entered into with the successful bidder. The bidder shall carefully go through the terms and conditions given in the Tender Specification and his offer should be in line with the terms and conditions specified herein.
- 1.11.2 On the bid being accepted by the Employer, contract will be signed and executed by and between the Employer and successful bidder at the earliest not later than one month (30 days) from the Letter of Award.
- 1.11.3 The successful bidder shall prepare 2 originals of contract as described for signing the contract.

Within 30 days after signing the contract, the Consultant shall make and submit the contract documents to the Employer free of charge. One original will be returned to the Consultant for his record and other original will be retained by the Employer.

**1.12** Notwithstanding any information and data, which may be contained in these tender documents, the bidder has to make independent inquiries and generally obtain his own information on all matters that may in any way affect prices, risks and obligations of the CONSULTANT under the Contract.

**1.13 DEVIATION**

Normally no deviation is permitted to Commercial terms & conditions and Technical specification. Nevertheless, if any of the bidders, takes any deviation to the conditions prescribed in the Notice Inviting Tender (NIT), it shall be clearly indicated in separate deviation schedule. The Employer shall consider such deviations and render / communicate their decisions if the deviation(s) taken by the bidder is not acceptable to them. In spite of such decision by the Employer on the deviation taken by the bidder, if the bidder declines to accept the same, the Employer shall be at liberty to reject such bid, as being not in conformity with the conditions of NIT, and the decision of the Employer in this regard is final and binding on the bidder. Deviation listed elsewhere in the Bid shall be summarily rejected and ignored.

**1.14** Unilateral revision or withdrawal of offer by the bidder within the subsistence of the validity period of offer shall not be permitted. Violation of this condition shall result in rejection of the bid without notice.

**CHIEF GENERAL MANAGER (Gen)  
APGCL**

**SECTION-II**

**COMMERCIAL TERMS AND CONDITIONS**

**SECTION-II**

**COMMERCIAL TERMS AND CONDITIONS**

**2.0 PREAMBLE:**

ASSAM POWER GENERATION CORPORATION LTD having its corporate office at Bijulee Bhawan, 3rd floor, Paltanbazar, Guwahati - 781 001, Assam, has been formed in the year 2004 after restructuring of Assam State Electricity Board, to carry out the generation activities of electricity in the state of Assam.

APGCL intends to set up a Grid connected 69 MW Solar PV based Power Project at Amguri. The proposed site is well connected through road and railway. The closest railway station is Amguri which is around 6 Km from the site. The nearest location of airport from the site is Jorhat (approx. 50 Km). The distance from Guwahati to the site is around 350 Km by road. The project site location is

Latitude: 26°49'26"

Longitude: 94°33'72"

**2.1** The total consultancy contract shall be executed in two phases, namely Phase-I and Phase-II.

**Phase-I scope of work** covered under 'Consultancy Services' is briefly outlined below.

- Basic Design & Engineering (preparation of tender document-RFP).
- Evaluation of Bids.
- Vendor selection (upto award of EPC contract).

**Phase-II scope of work** covered under 'Consultancy Services' is briefly outlined below.

- Review & approval of vendor drawings/documents
- Project Management Services.
- Field Services at site (Assistance in construction supervision, startup, testing & commissioning)

**2.2** The scope of work under each head mentioned above is described in detail in **Section-III** of this bid document. The details given in section-III are, however, only indicative and not exhaustive. The bidder may also include and mention clearly any additional items, which in their opinion, would be necessary to make the individual activity complete and purposeful in their bid. Any services not explicitly mentioned in the scope but required to complete the project in full must be carried out by the consultant without any extra cost to the Employer.

- 2.3** The bidder shall quote separately their rates for each item of service mentioned in Clause 2.1 above, in Indian Rupees for their services offered, broken down into sub elements as indicated in “ Price Schedule ” attached to this section-II as **ANNEXURE-III**
- 2.4** Payment to the bidder will be made according to the terms and conditions mentioned in various clauses and tables enumerated.
- 2.5** The compensation payable to the bidder will be subject to the provisions of Income Tax Act in India and any other statutory obligations which may arise from time to time. APGCL shall not be responsible for any Income Tax liability of the Bidder or personnel deputed by the bidder. APGCL will furnish necessary TDS certificate as per I.T Act.

**2.6 FACILITIES TO BE PROVIDED BY APGCL.**

APGCL will provide guest house accommodation at project site for the Consultant's visiting personnel, subject to the availability of such accommodation. Boarding and lodging for such accommodation is to be paid by the consulting engineers on the basis of standard rate as applicable for APGCL's own personnel of equivalent grade on duty.

Unfurnished residential accommodation will be provided to Consultant's Engineers by APGCL for personnel assigned to site on standard charges as applicable for APGCL's own personnel of equivalent grade, subject to availability of such accommodation.

APGCL will provide office accommodation to the consulting engineer for the site personnel including all usual facilities like electricity, drinking water and sanitary connections. APGCL will assist for P&T connection, Intercom facilities will be provided if available.

Medical facilities as available at site will be extended to the consulting engineers.

**2.7 EARNEST MONEY DEPOSIT (EMD)**

**Lump sum Rs 100000/- (Rupees one Lac only), refundable**, payable by bank draft drawn in favour of the Deputy General Manager,(F&A),O/O the Chief General Manager(Generation), APGCL, Bijulee Bhawan, Paltan Bazar, Guwahati-01. The EMD of the unsuccessful bidder shall be returned after finalizing the bid and with a written request from bidders to Deputy General Manager, (F&A), APGCL, Bijulee Bhawan.

**2.8 ESCALATION AND PRICE VARIATION**

The price quoted shall be firm. The consulting engineer shall clearly specify the price escalation and variation for project management services, if their service has to be extended beyond the period agreed between the EPC contractor and the Employer.

## **2.9 FORCE MAJEURE**

Neither APGCL nor the consulting engineer shall be considered in default in performance of the obligations under the contract if such performance is prevented or delayed by event, such as but not limited to, war, hostilities, revolutions, riots, civil commotion, strikes, lock outs, conflagrations, epidemic, accident, fire, wind, flood, drought, earthquake or because of any law and order, proclamation, regulation or ordinance of Government or of any act of God or for any other cause beyond the reasonable control of the party affected, provided notice in writing of any such cause with necessary evidence that the obligation under the contract in there by affected or prevented or delayed is given within the shortest possible period without delay.

## **2.10 PERFORMANCE GUARANTEE**

The consulting Engineer shall carry out the services in conformity with generally accepted norms and sound standards of engineering. The consulting Engineer shall be responsible for the technical soundness of the service rendered. In the event of any deficiency in those services, the consulting engineer shall promptly redo such design and engineering at no additional cost to APGCL as to enable APGCL, if necessary to carry out such rectification and/or modification as may be required.

A performance Bank guarantee equivalent to 10% of the total work value shall have to be submitted by the consultant immediately on issue of LOA. Performa performance guarantee is at **Annexure-IV**. The validity period of bank guarantee shall be intimated in LOA based on the scope of work.

## **2.11 ADDITIONAL SERVICE:**

Scope of this bid document generally covers all works required for successful commissioning of the project. Any item of work not specifically mentioned but essential for successful commissioning of the project will not be considered additional.

## **2.12 CONTRACT AGREEMENT**

A contract agreement shall have to be made for the consultancy services.

## **2.13 PAYMENT TERMS:**

The consultancy services are divided into two parts phase I and Phase II. APGCL may issue a single work order or two separate work orders for the respective parts and



reserves the right to withhold work order for any or both the parts at any time before or after finalization of bids without showing any reasons thereof.

Payment schedule is described in Table 2.1 Whatever rate is quoted by the bidder APGCL shall pay as per schedule of payment as in table 2.1.

**2.14 PAYMENT**

2.14.1 All payments shall be made after issue of Work Order/ signing of Contract. All payments quoted by the Bidder will be made in the same proportion indicated in the specification and finalized with the bidder.

**2.15 TERMS OF PAYMENT**

<b>Table 2.1</b>		
<b>PAYMENT SCHEDULE</b>		
<b>Phase I- Scope of Work</b>	<b>TIMELINE</b>	<b>FEES PAYABLE</b>
	1. Upon submission of draft NIT and Draft EPC Tender specification (RFP)	10%
	2. Finalization of NIT & RFP and on acceptance by APGCL	20%
	3. Submission of Technical Bid Evaluation Report	10%
	4. Submission of Price Bid Evaluation Report.	10%
	5. Selection of EPC contractor & submission of LOA	10%
	6. Upon submission of Draft Contract agreement	10%
	7. Finalization of Contract agreement and award of Contract	30%
	<b>TOTAL</b>	<b>100%</b>
<b>Phase II Scope of Work</b>	<b>PROJECT MANAGEMENT CONSULTANCY SERVICES</b>	<b>In %</b>
	1. Advance Payment on issue of LOA against submission of Advance Bank Guarantee	5%
	2. Approval of all drawing and soil test report and Topographical survey reports	10%

<b>Table 2.1</b>		
<b>PAYMENT SCHEDULE</b>		
	3. On Completion of Factory Inspection of major equipments e.g. solar modules, inverter, solar cables, SCB, Breakers & Transformer	10%
	4. On supervision of supply of all major equipments solar module, inverter & transformer.	10%
	5. On supervision of erection of all major components of the project i.e. Fencing, mounting structures, SPV modules, PCU, transformers, breakers, lightning arrestors, cables, connector, string combiner boxes along with monitoring system & SCADA, CT, PT etc	10%
	6. Completion of control room including metering room and installation of major equipment	10%
	7. Interconnection, successful testing and commissioning	10%
	8. On completion of witness and validation of Performance Guarantee & FAT	10%
	9. On submission of Work Completion Report	4%
	10. On submission of Plant Performance Reports from 1 & 2 quarterly, 3 <sup>rd</sup> to 5 <sup>th</sup> year half yearly (14 nos)(1.5% on submission of each report)	21%
<b>REIMBURSABLE EXPENSES ( Phase II part)</b>	Services for Inspection inside India and attending progress meetings etc	As per actual

### **2.16 Liquidated damage**

Delay in completion of the activities as per Clause no. 1.3, for reasons attributable to the consultant shall attract liquidated damage at the rate of 1 % of work value per week of delay subject to maximum of 10%(Ten Percent) of the total work value.

2.17 The factory of key equipment manufacturer outside India, employer shall reimburse economy class air travel charge for one person, to and fro, to the location of the factory and provide USD 250.00 per day as out of pocket expenses.

2.18 Any other terms not covered by above clause shall be governed by “General Conditions of Supply & Erection “of APGCL which is available at APGCL website.

## **ANNEXURE – I**

### **Documents to be submitted by the bidder as per Qualifying Requirements**

## **ANNEXURE – I**

### Documents to be submitted by the bidder as per Qualifying Requirements

- A) Forms as per Technical bid forms of Annexure II
- B) The Documentary evidence to be submitted by the Bidder shall be as follows:
1. End user certificate indicating the commissioning date of the unit for which the bidder / Associate has offered the consultancy services
  2. End user certificate indicating the performance of the units for which the Bidder has offered the consultancy services
- C) The certificate furnished by the Bidder shall contain the following details.
1. The certificate should be in the letter-head of the issuing firm and should be dated.
  2. Name and designation of the signing person should be clearly discernable.
  3. Role of the bidder indicating details of scope of work such as preparation of specification, detailed engineering, tendering assistance, supervision of construction, testing & commissioning of solar project
  4. Date of commissioning.
  5. Bidders are requested to furnish contact address of the User, Fax No., Phone No., E-mail ID, Contact Person etc., for clarifying any of the details.
- D) The bidder shall furnish the contract / LOA copy if requested by the Employer.

**ANNEXURE -II**  
**FORM OF BID**

**ANNEXURE – II**

**FORM OF BID**

(To be submitted by the Bidder in Part-I of his Bid)

APGCL's Bid No:

Bid No.: .....

Dated.....

To

Chief General Manager (Gen)

Assam power Generation Corporation Ltd

3<sup>rd</sup> floor, Bijulee Bhawan,

Paltan Bazar, Guwahati-781001

Subject: ..... (Name of Package) for .....(Name of the project / tender)

Invitation to Bid No.....

1. Having carefully examined all the Bid Document attached to your Invitation to Bid No..... dated ....., and its Amendments/ Corrigendum / clarifications issued till the date of bid opening, we agree to Complete the WORKS in conformity with all the terms and conditions stated in bid Document and its Amendments / Corrigendum / Clarifications issued till the date of bid opening and as per time schedule given in bid Document. The Plant, Equipment and System offered are of best and of latest technology and of international standards.
2. I / We declare and certify that I / We fully satisfy the Qualifying Requirements and the documentary proof as called for, have been annexed.
3. We undertake, in case our bid is accepted, to commence the work from the date of Letter of Award and to complete and deliver the whole of the work and responsibilities comprised in the contract within..... (Both in figures and words) months calculated from the date of Letter of Award and as per time schedule given in Tender Document.
4. We are submitting the Bid Guarantee for a sum of Rs..... in the form ..... as instructed by you. This Bid Guarantee shall be governed as per the stipulations provided in the "Instructions to Bidders".
5. We agree to abide by and keep our Bid valid initially for a period of 180 (one Hundred and eighty) days from the date of opening of Bid (part I) by Assam power Generation corporation Ltd. (APGCL) and it shall remain binding on us and may be accepted at any time before the expiry of that period.

6. Should our Bid be accepted, we hereby agree to abide by and fulfill all Terms and Conditions of Bid Document as accepted by us and in default thereof, to forfeit and pay to APGCL or APGCL's successors, assignees or authorized nominees such sums of money as are stipulated in conditions contained in Bid Document and agree to furnish Bank Guarantee for Contract Performance as per the proforma prescribed by APGCL and acceptable to APGCL and for the sum equal to 10% of "Contract Price" for the entire scope of work within 30 days from the date of Letter of Award. We understand that APGCL is not bound to accept the lowest or any Bids received and APGCL has the right to reject any bid, without assigning any reason whatsoever.
7. This Bid together with written acceptance thereof shall constitute a binding CONTRACT between APGCL and ourselves till a formal contract is executed.

8. Signed this ..... day of .....

Witness - 1 :

Signature

Signature

Occupatio

n Date

Address

Designation

Witness - 2 :

Signature

Occupation

Date

Address

(NAME IN BLOCK LETTERS) (with  
the Company seal)



**Project Consultancy Services for Grid Connected 69 MW solar PV power Project at Amguri,  
Sivasagar, Assam, India**

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<b>TECHNICAL BID FORM -1</b>		
	Name of Work	<b>Providing Consultancy Services (preparation of bid document for selection of EPC contractor, Evaluation of Bid, Award of EPC contract and Project Management Construction &amp; Supervision services) for setting up of a grid connected 69 MW Solar Photo-Voltaic Power Project at Amguri, Sivasagar, Assam, India</b>
	Name of Bidder	
	Address of bidder for communication with email ID	
	Name and address of person who is authorized to sign bid document and commit on behalf of the bidder with email ID & Mobile Phone no.	
	Details of payment for purchasing tender document	
Signature and seal of bidder.		

**Project Consultancy Services for Grid Connected 69 MW solar PV power Project at Amguri,  
Sivasagar, Assam, India**

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<b>TECHNICAL BID FORM-2</b>						
Experience of Bidder for preparation of Procurement of power plant						
a	b	c	d	e	f	g
Sl no	Name of project with capacity and type.	Name of project owner	Location details of project	Date of issue LOA / Work order for Procurement of power plant	Date of Submission of Procurement of power plant	Date / Expected date of commissioning of the project
1						
2						
3						
Documents required in support of entries in this table		1. Certificate from project owner or copy of work order as per <b>Annexure-I Documents to be submitted by the bidder as per Qualifying Requirements</b> above  2. Down loaded document from CEA's website for column g				
Signature of bidder						

**Project Consultancy Services for Grid Connected 69 MW solar PV power Project at Amguri,  
Sivasagar, Assam, India**

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<b>TECHNICAL BID FORM-3</b>						
Experience of Bidder for consultancy services for project management.						
a	b	c	d	e	f	g
Sl no	Name of project with capacity and type.	Name of project owner	Location details of project	Date of issue LOA / Work order for fro preparation of tender specification	Date of Submission of Bid evaluation	Date /Expected date of commissioning of the project
1						
2						
3						
Documents required in support of entries in this table		1. Certificate from project owner or copy of work order as per <b>Annexure-I Documents to be submitted by the bidder as per Qualifying Requirements</b> above. 2. Down loaded document from CEA's website for column g				
Signature of bidder						

**Project Consultancy Services for Grid Connected 69 MW solar PV power Project at Amguri,  
Sivasagar, Assam, India**

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<b>TECHNICAL FORM-4</b>				
Credential of consultant's Personnel.				
Sl no	Qualification	Name of Person	Qualification	Date of joining Consultants Firms.
1	Civil Engineering			
2	Mechanical Engineering			
3	Electrical engineering			
4	Electronics engineering			
	Documents required in support of Experience	C.V supported by certificates as mentioned columns in the right.	Certificate of university	Bidder's certificate
Signature of bidder				

**Project Consultancy Services for Grid Connected 69 MW solar PV power Project at Amguri,  
Sivasagar, Assam, India**

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<b>TECHNICAL BID FORM-5 (Job completion Schedule)</b>						
	Months from date of issue of LOA	1	2	3	4	5
1	Preparation of NITs and EPC Tender specification-RFP.					
2	Evaluation of EPC bids.					
3	Draft LOA to EPC contractor and finalization of Contract agreement.					

**ANNEXURE -III**

**FORM OF BID**

**(To be submitted by the Bidder along with Part-II [Price Bid])**

APGCL's Bid No.

Dated :

From

To

Chief General Manager (Gen)

Assam power Generation Corporation Ltd

3<sup>rd</sup> floor, Bijulee Bhawan,

Paltan Bazar, Guwahati-781001

1. I / We, the undersigned have carefully examined and understood the Bidding documents including the Amendments / Errata / Corrigendum / Clarifications issued till the date of tender opening. I / We hereby agree to carry out the entire works as described in the specifications in conformity with the specifications and Bidding documents, as per the prices quoted by us in the Schedule of Prices.
2. In the event of our proposal being accepted, we agree to furnish a Bank Guarantee for Contract Performance as per the proforma prescribed by Assam power Generation corporation Ltd and acceptable to the Assam power Generation corporation Ltd and for the sum equal to 10% of "Total Contract Price". The Bid Guarantee shall be released only after the Contract Performance Guarantee issued in favour of Assam power Generation corporation Ltd is received and accepted by the Assam power Generation corporation Ltd..

Signed this ..... day of .....2017

Witness - 1 :

Signature

Signature

Name in Block Letters

Occupation

Address

Name in Block Letters

Witness - 2 :

Designation

Signature

Name in Block Letters

Occupation

**Project Consultancy Services for Grid Connected 69 MW solar PV power Project at Amguri,  
Sivasagar, Assam, India**

Address

(Company seal)

**Price Bid**

<b>PRICE BID FORM-1</b>	
<b>Name of tender</b>	
<b>Providing Consultancy Services (preparation of bid document for selection of EPC contractor, Evaluation of Bid, Award of EPC contract and Project Management Construction &amp; Supervision services) for setting up of a grid connected 69 MW Solar Photo-Voltaic Power Project at Amguri, Sivasagar, Assam, India</b>	
1	NIT reference
2	Name of bidder
3	Address of bidder for communication with email ID & Mobile Phone no.
4	Name and address of person who is authorized to sign bid document and commit on behalf of the bidder with email ID& Mobile Phone no.
5	Details of payment for tender document
6	Details of EMD
7	<b>A PHASE I-SCOPE OF WORK</b> Preparation of EPC Tender Specifications, Evaluation of Bid and selection of EPC contractor(Upto Award of contract)
	Rs
	Taxes if any Rs: Total Rs
B	<b>PHASE II-SCOPE OF WORK</b> :Project Management Consultancy services
	Rs
	Taxes if any Rs: Total Rs
C	<b>REIMBURSABLE EXPENSES-</b> Services for Inspection and attending progress review meetings etc. as mentioned in relevant part of <b>sections III</b>
	Rs
8	Total (A+B+C) In figures and words.
Signature and seal of bidder:	

**PRICE BID FORM-2 :**

**PHASE I-SCOPE OF WORK:** Preparation of EPC Tender Specifications-RFP, Evaluation of Bid and selection of EPC contractor(Upto Award of contract)as described in relevant part of section III

	Amount in Rs
Preparation of EPC Tender Specifications, Evaluation of Bid and selection of EPC contractor(Upto Award of contract)	
Taxes if any	
Total Amount in Rs.(figures & words)	
Signature & seal of bidder	



**PRICE BID FORM-3**

**PHASE II-SCOPE OF WORK** :Project Management Consultancy services as described in relevant part of section III

	Amount in Rs
Project Management Consultancy services	
Taxes if any	
Total Amount in Rs.(figures & words)	
Signature & seal of bidder	

<b>PRICE BID FORM-4</b>		
<b>REIMBURSABLE EXPENSES-</b> Services for Inspection inside India and attending progress meetings etc as mentioned in relevant part of <b>sections III</b>		
<b>a</b>	<b>b</b>	<b>c</b>
	Items of expenses	At actual
1.	Reimbursement of air Travel charges (Economy Class)	Keep blank
2.	upper limit of Hotel Charges per man per day	Rs.....
3.	Reimbursement of man day charges (India or abroad)	Rs.....
4.	Upper limit of reimbursement of out of pocket expenses per man per day.	Rs.....
Total (2+3+4) Amount in Rs.(figures & words)		
Note: 1. Reimbursement of travel charges shall be loaded by APGCL.		
Signature & seal of bidder		

**ANNEXURE IV**

**PROFORMA BANK GUARANTEE  
FOR CONTRACT PERFORMANCE**

**ANNEXURE-A**

**PROFORMA BANK GUARANTEE AGAINST CONTRACT PERFORMANCE**

Whereas the Assam Power Generation Corporation Ltd. (herein after called APGCL) has issued work order no..... dt ..... to M/s.....(herein after called the Firm) for Project Consultancy Services including preparation of Tender Specification for EPC contract, Bid evaluation, Project Management Construction & Supervision for Grid Connected 69 MW solar PV power Project at Amguri, Sivasagar, Assam. Whereas of M/s ..... has accepted the work order along with the terms and condition contained therein.

Whereas by virtue of the **clause no. 2.10** of the bid specification the firm was required to furnish a Bank Guarantee from a Nationalised/scheduled Bank for a sum of Rs..... i.e.10% of the total work value as security for the satisfactory performance of the work done.

Whereas the Firm has requested APGCL to accept the guarantee of (-----) (Name of the Nationalised/scheduled Bank with address) and the APGCL has agreed to accept the same.

In consideration of acceptance of work order by M/s ..... issued by APGCL, we the ----- (Name of the Nationalised/scheduled Bank with address) undertake to indemnify and keep indemnify APGCL against any damage, injury or loss to it by breach or violation of the contract work order and shall pay APGCL all sums demanded by it towards such injury, loss or damage or penalties as and when demanded by APGCL, provided that the total liability under the guarantee shall not exceed Rs. .... only.

Provided further that this guarantee shall remain in force for a period .....month from the date of drawing out this guarantee.

Provided further that this guarantee shall not continue in force beyond for a period ..... month from the date of drawing out this guarantee unless it is renewed. All claims under this guarantee shall be preferred to the executant's bank before .....

We (\_\_\_\_\_) (Name of the Nationalised/scheduled Bank with address) hereby undertake not to revoke this guarantee during the period it is in force without obtaining the prior written consent of the Company. Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs..... .Our guarantee shall remain in force until ..... Unless a claim in writing is presented to us and if unpaid, a suit or action to enforce such claims is filed against us within six months from the date i.e. within..... All rights under said guarantee shall be forfeited and we shall be released and discharged from all liabilities there under.

Dated at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 2016

(Signature on behalf of the Nationalised/scheduled Bank)

(Seal of the Nationalised/scheduled Bank)

## **SECTION – III**

# **TECHNICAL SPECIFICATION**

### **SECTION – III**

#### **3 Scope of Services.**

The services to be provided by the consulting firm for the scope of contract as mentioned in Clause 1.2 are as follows

#### **PHASE I-SCOPE OF WORK**

##### **3.1 Drafting of Notice Inviting Tender (NIT)**

##### **3.2 Preparation of EPC Tender Specifications (Request for Proposal)**

Tender Specifications (RFP) consisting of Technical and commercial part Documents. The RFP has to be drafted based on MNRE guidelines. This will include review and suggest necessary changes in the RFP. Soft copies as well as 5(five) nos of Hard copies of first draft RFP and the final RFP are to be submitted.

The RFP, qualification requirements, bid evaluation criteria, contract agreement, payment terms and other elements would be developed on EPC based model.

##### **3.3 Participating in pre bid meeting and assist & advice in responding to queries/comments of bidders and drafting of Addendum to the RFP.**

##### **3.4 The tenders, after receipt, will be evaluated by the consultant both technically, commercially and financially within the time stipulated in the offer. All communications shall be made through APGCL. Tender documents shall be prepared in clear unambiguous language and terms in a way which will exclude requirement of any communication with the Turnkey Bidders during the evaluation process of the tenders. If at all such communication becomes inevitable the same shall be made, through APGCL and discussion will be held with the bidders in association with APGCL. Thereafter, the financial evaluation will be carried out by the consultant and the recommendation of the best suitable offer will be made in consultation with APGCL. The consultant requires to submission of evaluation report & advice on the selection of successful bidder**

##### **3.5 Preparation & issue of LOI/LOA.**

##### **3.6 Preparation and finalization of Contract Agreement to be signed between APGCL and successful bidder.**

##### **3.7 The work is to be carried out as per the directions and upon the satisfaction of employer.**

**PHASE II-SCOPE OF WORK**

- 3.8** The scope of work for the consultancy service for the project management consultant for 69MW of grid connected Solar Photovoltaic Power plant shall be to review the Engineering Service for submission from the EPC Contractor, Project Management Service, factory inspection of key equipment, Supervision of construction, erection, testing and commissioning activities at site, witnessing & validating the Performance Guarantee tests and submission of Work Completion report.

**The Contractor shall be required to depute personnel full time at the project site during the entire duration of the project.**

**3.8.1 REVIEW ENGINEERING SERVICES FOR SUBMISSION FROM THE EPC CONTRACTOR**

**Design review**

Review of the Contractor's basic and detailed design engineering and drawings and other relevant technical documentation concerning major systems, equipment, materials and works. The objective of the design review shall be to determine the compatibility of equipment and plant systems that systems will be capable of safely & optimally performing their specified functions during the entire intended life-time and that adequate technical specification and drawings are provided by the Contractor(s) for all plant equipment. The Consultant shall review the adequacy of design and check on the Contractor's designs for compliance to:

- i. Tender requirements. (All the requirement specified in the tender document issued for the selection of EPC Contractor for the project-
- ii. Code requirements (International Electro technical Commission (IEC) and other codes which are mentioned the RFP document.
- iii. Statutory requirements (necessary legal permits, approvals etc obtained by the EPC Contractor)
- iv. Optimization (plant optimization, land optimization etc.)
- v. Module structure and ground area occupation ratio for each of the technology
- vi. Interface requirements (Remote monitoring system like SCADA for data access etc.)
- vii. Operability and Maintainability (adequacy of design and layout of the plant to meet to ease the O&M requirements of the plant like equipment accessibility, cleaning and removal provisions etc.)
- viii. Adequacy of Design to meet Functional and Guaranteed parameters.
- ix. Evacuation infrastructure (Compatibility of system for evacuation of power to the grid)

**Technical Assistance for checking compliance of design, components characteristics, test procedures applied etc. with international standards including review of project execution planning of EPC contractor**

- i. Review, comment and make recommendations for further steps on all contracts/project agreements, including mainly:
  - a. EPC Contract.
  - b. O&M Contract, including operational concept (O&M manual)
  - c. Adequacy of the technical warranties and certification procedures e.g. performance test procedures and protocols, performance and availability criteria, Testing-procedure of key components.
- ii. Review, comment and make recommendations for further steps on permits and licenses (status, constraints, etc.)
- iii. Review, comments and make recommendations for further steps on time schedule and payment milestones.
- iv. Review, comments and make recommendations for further steps on project management/risk management.
- v. Review, comments and make recommendations for further steps on evaluation major project risks.

**Review of Quality Assurance plans**

- i. Assist Employer in approval of sub-contractor(s) proposed by the contractor(s).
- ii. Assist employer in approvals as per the RFP document of EPC contract.
- iii. Review and assist in finalization of the Contractor's/sub-contractor's Quality plans including customer hold points for inspection.

**3.8.2 FACTORY INSPECTION OF KEY EQUIPMENT**

- i. As per consent of APGCL, review and finalization of Shop and Site performance test procedures for all major equipment and systems.
- ii. As per consent of APGCL, providing the manpower services for inspections and quality checks along with APGCL's officials, to be carried out for the equipment at the manufacturers' works/Bought out items and submitting the inspection reports.
- iii. Review of clearance for dispatch.



### **3.8.3 PROJECT MANAGEMENT SERVICES**

The services under project Management Services shall include the following:

- i. Prior to start of site supervision, prepare a Project Manual for the use of the Employers and OE's project management, engineering review and site supervision teams. The Project Manual shall outline the engineering review and site supervision procedures, internal approval procedures, organization schedule control and other procedures, including flows, diagrams for the procedures, and all necessary descriptions for a well functioning site supervision team and site office. The Project Manual shall adhere to general procedures already established by the Employer.
- ii. Attend the project co-ordination meeting conducted by employer with vendors/Contractor(s) as per the Employer's requirements.
- iii. Review of schedules and its latest status provided by the Contractor(s).
- iv. Establish project co-ordination and communication procedures, procedures for documents transmission with various vendor(s)/contractor(s).
- v. Review of EPC Contractor's plans for site Management and monitor his staffing plan for efficient use of supervisory personnel, labor and materials and equipment on site.
- vi. Assist in certification of Contractor's project milestones.
- vii. Provide the Employer with recommendations regarding the imposition of liquidated damages should this become necessary as a result of EPC Contract delays and /or performance deficiencies.
- viii. Assist Employer in resolving of claims & disputes, if any with the Contractor(s) and also assist in resolving design related, site related and contractual issues.
- ix. Preparation of Monthly MIS reports for progress, monitoring, budgeted progress vs. actual indicating slippages, deviations and suggesting remedial measures.
- x. Coordination of project design engineering, procurement, erection and commissioning.
- xi. Make available and manage a secure virtual data-room for storage and remote viewing and editing of all project relevant documents (such as but not limited to contracts, schedules, design parts-lists and variation orders).

### **3.8.4 TECHICAL ASSISTANCE FOR CONSTRUCTION SUPERVISION AND TESTING**

During the construction phase of the Amguri project, the PMC will assist APGCL in reviewing the EPC contractor's performance and implementation of the project. This will include:

- i. Construction monitoring services during project execution in compliance with the technical design, the contracted specifications/requirements and project schedule.
- ii. Carry out monthly site inspections and elaborate a comprehensive report (also including Photo- documentation of covered or buried parts) to be provided in a completed manner no more than 5 working days after the respective site inspection.
- iii. Review and evaluation of solar modules flasher sets.
- iv. Mechanical Completion

The consultant will prepare suitable check-lists as per relevant acceptable international standards and based on these check-lists the mechanical completion of the facilities shall be reviewed for their conformity to relevant standards and safety aspects, covering but not being limited to the following plant components:

- a. Solar modules
  - b. Junction and combiner boxes
  - c. Mounting systems
  - d. Inverters and inverter system
  - e. Communication system
  - f. String monitoring system
  - g. Energy meters
  - h. SCADA/monitoring system
  - i. Fences and security system
  - j. Transformers
  - k. Interfacing substation
  - l. Cabling (lying and adequate fixing)
  - m. Earthing system
  - n. Electric safety devices
  - o. Meteorological station
- v. Participation and monitoring of the site and laboratory testing of the solar modules as per prevailing standard practice.
  - vi. Review of EPC contractor's progress report.
  - vii. Draft APGCL's bi-monthly progress report.

Apart from corporate office expert team, PMC should depute at least 3 Nos of experts at Amguri site (24/7 service) from date of LoA to completion of Final Acceptance Test (FAT) of the 69 MW Solar

power project. The experts should be from civil engineering, electrical engineering & electronic engineering field each.

These experts have to perform site management services like supervision of construction, erection, testing and commissioning of equipment and facilities by the contractor(s) to ensure compliance to quality, safety and performance requirements. This shall include the following:

- I. Establishment quality control documents check lists and protocols for the proper documentation of the site activities.
- II. Witness and assist in certification of the quality tests and check points.
- III. On site physical inspections to identify differences between approved plan and as -built conditions. In case of meaning full discrepancies, the consultant shall determine the change in the as-built plans with prior approval by the employer.
- IV. Supervision of the civil, structural works, erection of Solar Module, mechanical, electrical, control and instrumentation equipment to ensure the compliance of approved erection methodology, specification and drawings.
- V. Review all the mechanical structures, solar PV equipment and overall workmanship of the SPV power plants with respect to warrantees against any manufacturing/installation defects.
- VI. Review Contractor's Environmental, Health and Safety plans and ensure the implementation of the same.
- VII. Review claims for payment, compare content of claim with contractual obligations and with the actually achieved progress.
- VIII. Review construction schedules of the Contractor(s) and monitoring Site activities with respect to the latest approved drawing/document.
- IX. Review the Contractors' documents for testing, commissioning, performance testing for establishing guaranteed performance and for operation and maintenance.
- X. Review various Pre-commissioning and Commissioning activities.
- XI. Review the modalities and then assist in acceptance tests of various systems/packages.
- XII. Witness the PG test and ensure complete, concise and coherent contractor's documentation of the test results to ensure that the test is in accordance with agreed codes.
- XIII. Review the PG test report, verify the test results and recommend to the Employer whether or not all required performance guarantees are met.

XIV. The Consultant shall supervise different critical tests to evaluate performance of plants.  
(Examples- open circuit test, Short circuit test, Flash test, EL-imaging, PID test, EVA gel-content testing, string continuity test, insulation test for cables and other test as specified in IEC standards for Solar PV power plant(s))

### **3.8.5 TECHNICAL ASSISTANCE FOR SITE ACCEPTANCE TESTS AND ANALYSIS OF TRIAL OPERATIONS RESULTS**

Together or subsequent to Mechanical Completion, performance tests are expected to be performed in order to verify if the installation reaches the expected yield levels at given irradiation conditions.

- I. During the testing and completion phase of the project, the technical Support Consultant will assist APGCL in the completion of the following tasks:
  - a. Verification of the test procedures suggested by the contractors
  - b. Visit of the plant prior to the start of the performance test in order to verify the installation of the test equipment (irradiation measurement, etc.)
  - c. Review of information and reports on commissioning and review of trial operation.
  - d. Attendance and monitoring of the performance and reliability tests.
  - e. Review of performance test result in view of liquidated damage requests.
  - f. PV plant installation and mounting inspections and writing of a punch list/snagging list.
- II. Confirmation of final Acceptance
  - a. Assess the Protocols of mechanical completion and provisional acceptance
  - b. Visit the plant and comment on the status of the installation
  - c. Verify the completion of the items identified in the punch list/snagging list
  - d. Assess the actual performance in comparison with the stipulations of the EPC contracts.
  - e. Review and comment on the final as-built documentation from the contractor.

### **3.8.6 SUBMISSION OF WORK COMPLETION REPORT**

Submit Work Completion Report to the Employer when the Project has achieved Mechanical Completion, Provisional Acceptances, Substantial Completion, and final Acceptance and that the plant has been fully accepted and has entered commercial operation.

### **3.8.7 ANALYSIS & TESTING OF OPERATIONAL RESULTS-FOR FIVE YEARS FROM FAT**

During the commercial operation of the Consultant shall review the performance of the Plant as well as the O&M contractor and report the results to APGCL as follows:

- I. During the first two years on a quarterly basis.
- II. From year three to year five on a semi-annually basis.

The analysis shall include but no be limited to:

- a. Testing of PV string. String IV curve measurement.
- b. Insulation resistance testing
- c. Current voltage measurement of the string
- d. Testing of modules by thermal imaging cameras.  
(All the testing's should be carried out as per IFC/EVS EN62446)
- e. The daily irradiation data over the reported period
- f. The daily output of the solar generator,
- g. The fed-in energy into the grid for each PV block,
- h. The performance ratio,
- i. The performance data in relation to the performance warranty,
- j. Review of the plant logbook for the reported period
- k. Observance and investigation into any irregular behavior of the solar generator, as well as recommendation of measures that require to be taken
- l. A list of all damage and/or defects occurred during the reported period.

### **3.9 VARIATION IN THE SCOPE**

The employer reserves the right to delete any items of works from the scope of the consultant and execute the same either by APGCL or any other agency appointed by him.

The provision shall apply any time before award of contract or during the period of the contract if such a situation arises. The total contract price in such cases shall stand suitably adjusted.

-----X-----