

## SPECIAL CONDITIONS OF CONTRACT

### **1. SITE CONDITIONS**

- a) Before tendering the Contractor shall get themselves acquainted with site conditions. The rates quoted by the contractor shall be deemed to have been quoted after getting acquainted with the prevailing site conditions. No claims on the pretext of ignorance of site conditions shall be entertained.
- b) The site of work is as mentioned in the Tender document.

### **2. SITE FACILITIES**

The Employer will allot land as available free of cost to the contractor for his office stores. He must maintain the areas allotted to him in a neat and clean conditions as required by the Employer. The contractor shall provide adequate storage and office facilities with approval from the Engineer. The rate quoted by the contractor shall be deemed to include for these and no separate payment will be made towards these. On completion of work, the site shall be cleaned by the contractor of all materials, temporary debris, rubbish plants and equipment's, belonging to the contractor at no extra cost. The site and surroundings shall be handed over in a neat and clean condition. In case of any failure by the contractor, the employer will get inside cleared at risk and cost of the Contractor.

### **3. ESCALATION**

The rates to be quoted by the tenderer shall be firm and shall cover and include all statutory levies, arising from, acts passed by parliament or by state legislature, the rates shall further be deemed to include statutory levies arising from such Acts, Central or State, which may come in to force subsequent to submission of tenders. The tenderer shall note that no claim for enhancement of rates, on the ground that existing statutory levies have been increased, or that new statutory levies have come in to effect after tender, or on any other ground, will be entertained on any account.

### **4. EXTENSION OF TIME OR PENALTY/LIQUIDATED DAMAGES**

Extension of time or penalty/liquidated damages as the case may be will be determined as stipulated in clause No. 2.7.9 of BHEL General Conditions of Contract 2019.

In addition to the above a penalty of 0.5% per week of delay on the value of work order will be levied if vendor fails to start the O& M work within two week of the date of notice.

5. The Contractor is required to take insurance for all workers employed on works towards payment for workmen compensation. The insurance has to be taken out within 15 days of the award of work and has to be produced at the time of signing agreement. Half (1/2%) shall be deducted for every bill if the contractor fails to produce a proof of having taken such an insurance to cover his workmen. However, the contractor shall be fully responsible for all the consequences arising out of such default. This may also be read with relevant clauses of BHEL GCC 2019.
6. The monthly/ quarterly (as applicable) O&M payment of the contractor shall be released on submission of comparison of generation as per guaranteed parameter vis-à-vis Actual generation. The shortfall (if any) w.r.t. guaranteed generation shall be duly supported by documentary evidence.  
In case of shortfall w.r.t. guaranteed generation parameter, the Engineering department to certify that "the reasons submitted by the contractor are beyond its control. The amount equivalent to shortfall in generation may be absorbed by BHEL on exceptional basis.
7. Bidder agrees to submit performance security required for execution of the contract within the time period mentioned. In case of delay in submission of performance security, enhanced performance security which would include interest (SB/ rate + 6%) for the delayed period, shall be submitted by the bidder. Further, if performance security is not submitted till such time the first bill becomes due, the amount of performance security due shall be recovered as per terms defined in NIT I contract, from the bills along with due interest.

**Certificate by Chartered Accountant on letter head**

This is to Certify that M/S .....  
(hereinafter referred to as 'company') having its registered office at .....  
..... is registered under MSMED Act 2006, (Entrepreneur  
Memorandum No (Part-II) ..... dtd:.....  
Category: ..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the  
latest audited financial year ..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost  
excluding land and building and the items specified by the Ministry of Small Scale Industries vide its  
notification No.S.O.1722(E) dated October 5, 2006 :  
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and  
furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED  
Act, 2006:  
Rs.....Lacs

**(Strike off whichever is not applicable)**

The above investment of Rs.....Lacs is within permissible limit of  
Rs.....Lacs for .....Micro / Small (Strike off which is not applicable)  
Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/ Small) (Strike off which is not  
applicable) and the date of graduation of such enterprise from its original category is .....  
(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such  
enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published  
in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant



## ANNEXURE II

### Electronic Funds Transfer (EFT) OR Paylink Direct Credit Form

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): ☐ CREATE ☐ CHANGE

BHEL Vendor / Supplier Code:	
Company Name :	
Permanent Account Number(PAN):	
Address	

City:		PINCODE		STATE	
-------	--	---------	--	-------	--

Contact Person(s)	
Telephone No:	
Fax No:	
e-mail id:	

1 Bank Name:	
2 Bank Address:	
3 Bank Telephone No:	
4 Bank Account No:	
5 Account Type: Savings/Cash Credit	
6 9 Digit Code Number of Bank and branch appearing on MICR cheque issued by Bank	
7 Bank swift Code(applicable for EFT only)	
8 Bank IFSC code(applicable for RTGS)	
9 Bank IFSC code(applicable for NEFT)	

- A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.
- B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
- C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation.
- D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Designation:

Telephone NO. with STD Code

Company Seal

#### Bank Certificate

We certify that \_\_\_\_\_ has an Account No \_\_\_\_\_ with us and we confirm that the bank details given above are correct as per our records.

Date:

(.....)

Place:

Signature

Please return completed form along with a blank cancelled cheque or photocopy thereof to:

Bharath Heavy Electricals Ltd,

Attn:

Electronics Division, Mysore Road,

BANGALORE - 560 026

In case of any Query, please call : 080-26998xxx / 2674xxxx or fax no. 080-2674xxxx



ANNEXURE-III

**UNDERTAKING BY THE TENDERER(S)**

We \_\_\_\_\_ (Name of the Tenderer) hereby declare that we have fully read and thoroughly understood the tender requirements and accept all terms and conditions of the tender. Our offer is in confirmation to all the terms and conditions of the tender.

We also confirm that if once work is awarded to us, we are responsible for making the due payment of wage/salary to all our Labourers/staff along with all statutory payments in timely manner. In case of any default from our side in making payment as mentioned above, BHEL may make the salary/wage/lump sum payment directly to our labourers/staff deployed by us and is authorized to recover the expenditure so incurred with processing charges from our Security Deposit/Bank Guarantee/ Running Bills. We further confirm that, we will be responsible for all statutory obligations (like Minimum wages, PF, ESI and Bonus etc.) towards our deployed manpower.

We also hereby agree that, at the end of every wage month, we will submit the wage details due to the manpower deployed by us to BHEL before 10<sup>th</sup> of next month.

Date:

Bidder sign with seal

Note: This undertaking on letter head is mandatory for technical qualification of the bid.



## Annexure-IV

### **DECLARATION BY THE BIDDER**

We \_\_\_\_\_ (Name of the Bidder) hereby declare that we will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

In case, we will found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

Date:

Bidder sign with seal

**Note:** This declaration on letter head is mandatory for technical qualification of the bid.



#### **Additional Clauses for GST:**

1. BHEL GST Number of Nodal Agency:

Nodal Unit Registered as Supplier of Goods/Services in GST:

GSTIN of Nodal Unit: Will be intimated later after award of work.

2. HSN (Harmonized System of Nomenclature) / SAC (Services Accounting Code) to be mandatorily mentioned in all quotations & invoices submitted.
3. Invoice submitted should be in the format as specified under GST Laws viz. all details as mentioned in Invoice Rules like GSTN registration number, invoice number, quantity, rate, value, taxes with nomenclature – CGST, SGST, IGST mentioned separately, HSN Code / SAC Code etc.
4. Payment of GST to vendors as applicable will be made only if it is matching with data uploaded by Vendors.
5. Vendors to give undertaking that GST as mentioned in the Invoice has been paid/will be paid either through cash or admissible input credit and also file the returns
6. For invoices paid on Reverse charge basis – that it is “payable on reverse charge basis” to be mentioned on the invoice.
7. With respect to supplies, vendor should intimate BHEL immediately on dispatch for parallel billing on customer
8. Vendor should get GST registration, if not available, in the state of Andhra Pradesh immediately after placement of order.

## Unprice Bid (Annexure-I)

### BOQ of O&M works for 25MW Floating Solar PV Power Plant at NTPC, Simhadri for a period of 36 months

Sl. No.	Item / Activity description	Unit	Qty	Details	Minimum Manpower	Type of Manpower	Estimated Unit rate	Estimated Total Value
<b>OPERATION &amp; MAINTENANCE FOR 36 MONTHS</b>								
1	Management of complete O & M activities by O&M incharge. I. One (1) Engineer (B. Tech in Electrical Engg.) with 33 kV Power station/switchyard working experience to be appointed who will be the overall O & M in-charge of the plant.	Man Months	36	Major responsibilities of O&M incharge : (i) Allotment of work to all the O&M staff and supervision of O&M works as per schedule approved by BHEL. (ii) Sending Daily, weekly and Monthly report to BHEL by mail. (iii) Interaction with customer / NTPC / SLDC etc. (iv) Co-ordinating and liasioning with SRLDC for declaring forecast and DSM data on daily basis as per grid protocol. (v) Coordinating with sub-station upon grid failures /cable faults and implementing the needful steps to restore the plant to normal operation. (vi) Monthly downloading of data from ABT meter using CMRI / as instructed by NTPC. (vii) Maintaining plant records and log books, stock register and reporting to BHEL. (viii) Trouble-shooting and Updation of SCADA system if required as instructed by BHEL. (ix) Theft incidents: immediate reporting to BHEL, filing FIRs at police stations on BHEL behalf, coordination for site inspection by insurance companies and clearance of insurance claims, logging of events (date, time) and maintaining records. (x) Accidents: immediate reporting to BHEL, coordinating with hospitals, logging of events (data, time) and maintaining records. Payment for Services of O & M in Charge shall be as per attendance records maintained and deductions will be passed in case of non-availability (Proportional basis).	1	Engineering Graduate	33648.00	1211328
2	Plant Operation works such as (i) Logging of DC, AC, grid parameters (current, voltage, power, energy) at PCUs, HT panels, transformer temperatures, equipment tripping/ breakdown, grid outage as per BHEL formats. (ii) SCADA data station / HMI PC operations/ operation for daily monitoring of weather parameters, trend graphs and urgent reporting to BHEL in case of any problems / anomalies observed with any of the parameters, resolving communication issues between SCADA and other equipment, healthiness of all equipment. (iii) Supervision of electricians deployed per shift.	Man Months	72	Minimum 2 (Two) technicians (with Diploma in Electrical with 3 years of experience). They should have necessary skills in operating electrical / electronic / mechanical equipment, taking measurements, data logging / maintaining registers, preparation of reports in computer. The O&M works mentioned are indicative. All the activities required for O&M shall be carried out by technicians as instructed by BHEL. Monthly reports to be prepared and submitted by mail to BHEL for the various parameters including Earth resistance, String current, Energy exported etc. as per report formats finalized by BHEL. Diploma technician must be certified for operating installations of 33KV and above. Certificate / license copy to be submitted to BHEL before commencement of O&M works. One technician to be posted in Night shift operation. Measurement of above activities shall be done as per O&M Log book records maintained. Deductions shall be passed in O&M Contractor Bills for any activities not completed.	2	Highly Skilled	30379.00	2187288

3	Electrical operation works (i) Logging of plant operation data as instruction of technicians. (ii) Attending faults in electrical systmes and reporting	Man Months	144	Minimum 4 (Four) electricians with field experience in solar plant to be deployed. They should have necessary skills in attending faults in DC/AC systems under supervision of technicians. The O&M works mentioned are indicative. One electrician to be posted in Night shift operation. Measurement of above avtivities shall be done as per O&M Log book records maintained. Deductions shall be passed in O&M Contractor Bills for any activities not completed.	4	Skilled	27671.00	3984624
4	Carrying out Preventive and Breakdown maintenance as per O & M schedule / OEM guidelines / maintenance manual such as a) Cleaning, tightness checks, lubrication and other maintenance of equipment -PCUs, HT panels, Inverter transformers, Auxiliary transformers, ACDB, FCBC, UPS, Battery banks, SCBs, SCADA, WMS, Fire Alarm, ESE Lightning arresters, earthing, light fitting - indoor and outdoor etc. b) Replacement of Silica gel, gaskets, Rectification of Oil leakages in all transformers. c) Repair/ replacement of failed 33KV cable inside plant including underground transmission till evacuation point at NTPC, replacement of failed 33 kV termination/ jointing kits. d) Trouble-shooting of solar array problems as DC earth fault, OFC/ communication cable faults, replacement of damaged PV modules, SCB components etc. (e) Monthly earth resistance measurement and recording value on the Earth chambers (f) Watering of earth pits	Months	36	Minimum 1 technicians (Diploma/ITI) and minimum 1 Labour to be allocated for this activity. (i) List of equipemts is indicative. Maintenace of all the equipments installed in plant is in vendor's scope. (ii) Periodic maintenance shall be preferably carried out during early morning or evening to avoid generation loss. (iii) Whenever a fault has occurred, the contractor has to attend to rectify the fault & the fault must be rectified within 48 hours from the time of occurrence of fault. (iv) Major spares such as complete equipment failures of CT, PT, LA, Breaker, Isolator, SCB, PCU, transformer, cables, HT termination and jointing kits etc. if any will be supplied by BHEL. (v) Minor spares and consumables such as MCBs, Fuses, switch yards and building Lights, fans, indication lamps, gaskets, silica gel, acid for battery, hardwares, cable lugs and glands of all required sizes, MC4 connectors, PCU dust filter, sanitary fittings etc. if required shall be supplied by vendor. vi) In case of Maintenance activity / failure / damage / accident / replacement / repair required for any of the plant equipment such as Solar modules, HT panels, all transformers etc. or for any other site related activities, unloading, erection, installation, charging, co-ordination with agencies involved, etc., shall be in O & M vendor's scope. Arrangement of Crane / hydra / JCB/ additional labour hiring / Ladder, etc., for arranging replacement of failed equipment shall also be in the scope of O&M vendor. (vii) All tools and tackles, measuring instruments, testing equipment required for maintenance activities shall be arranged by O&M vendor. Measurement of above avtivities shall be done as per O&M Log book records maintained. Deductions shall be passed in O&M Contractor Bills for any activities not completed.	2	1 Skilled+ 1 Unskilled	48573.00	1748628



5	<p>Operation &amp; Maintenance of Module washing System installed by BHEL. Washing of SPV modules fitted on floater – Solar array consists of total 109800 number of PV modules distributed in 10 blocks. Each block consists of typically 10980 numbers of PV modules. Each PV modules must be cleaned at least thrice in a month by using water and Wiper. Use of wiper/mop is must. Cleaning of modules shall be carried out block wise. All type of tools &amp; tackles required for maintenance of module washing system shall be arranged by contractor. Cleaning of floater and pathways also need to be attended as and when required.</p> <p>Bidder shall supply minimum 25 number of life jacket and maintain the same through O &amp; M period. Personnel entering the pond and pond embankment area must wear the same all the time. in case of failure to wear, bidder are liable for fine imposed by BHEL/NTPC.</p>	Months	36	<p>(i) Required labourers (Minimum 12 Nos.) to be allocated to complete this activity within the scheduled time period.</p> <p>(ii) Reservoir Water shall be used for the modules cleaning.</p> <p>(iv) All the consumables for cleaning of modules such as cleaning brushes, mopping sticks etc. shall be arranged by vendor. Detergent/any other chemical shall not be used for module cleaning without written permission from BHEL/NTPC.</p> <p>(v) In case of natural cleaning of solar modules by rains and cleaning not carried out, no payment will be done for that cycle within the month.</p> <p>(vi) Three cycles of cleaning by wiping of entire solar modules has to be completed in a month by the vendor. In case, lesser quantity of solar modules are cleaned, proportionate payment will be made for quantity of solar modules cleaned up to last day of each month.</p> <p>(vii) Each solar module is of 2m x 1m size and mounted on each Pontoon.</p> <p>(viii) The module washing system installed by BHEL comprising Booster pumps, HDPE pipe network, Valves, hose pipes etc. O &amp; M of the system shall be in contractor's scope. All type of tools and tackles required for maintenance of MWS shall be arranged by contractor.</p> <p>Measurement of above activity shall be done as per table basis and as per cycle basis. Deductions shall be passed in O &amp; M Contractor Bills for any incomplete work.</p>	12	Unskilled	250824	9029664
6	<p>Minimum Twelve (12) security guards (all unarmed) per day to be deployed in three shifts with competence to handle tough situations and safeguard the plant from miscreants. Shift wise deputation of Security staff will be as per decision of BHEL site in-charge during O &amp; M.</p>	Months	36	<p>(i) Securing entire plant area. Security shall be deployed round the clock and 365 days a year.</p> <p>(ii) In case of theft, FIR to be lodged by O&amp;M vendor.</p> <p><b>(iii) If theft incidents are due to negligence of O&amp;M vendor such as shortage of security, the loss recovery shall be done from vendor.</b></p> <p>Measurement of Services of Security guards shall be as per attendance records maintained and deductions will be passed in O&amp;M Contractor Bills in case of non-availability at site.</p>	12	Security (Without Arm)	332052	11953872
7	<p>General maintenance works such as Daily housekeeping activity for Main Control room and Electrical Equipment Rooms including toilets, Garbage removal from solar array area, grass cutting at transformer yard, switchyard, and for clearing vegetation which may foul with Ropes and wires of the floater system from the bund area, repair of plumbing works, Sintex tanks, cleaning of sewerage lines, septic tanks, soak pits if required, minor civil repair works such as leakages, doors, windows, rolling shutters, ventilators, floor/ tiles/ wall cracks, cleaning of drains etc.</p>	Months	36	<p>(i) Required labourers (Minimum 1 for general Housekeeping and 1 nos. for grass cutting and specific housekeeping work) to be allocated for this activity.</p> <p>(ii) All the buildings - Main Control room and Electrical Equipment Rooms to be mopped daily and surroundings to be kept clean.</p> <p>(iii) All toilets to be cleaned daily.</p> <p>(iv) Regular Grass cutting at transformer yard, switchyard, and for clearing vegetation which may foul with Ropes and wires of the floater system from the bund area.</p> <p>(v) All tools &amp; consumables required for this activity shall be in vendor's scope.</p> <p>Measurement of above activities shall be done as per O &amp; M Log book records maintained. Deductions shall be passed in O &amp; M Contractor Bills for any activities not completed.</p>	2	Unskilled	41804.00	1504944

8	Floater and Floater Pathways maintenance : Periodic maintenance shall be carried out for checking the floater condition, sign of crack/ damage, Tightning of mooring ropes and any other maintenace needed to maintain healthiness of floating island as per OEM's O & M Manual. This includes replacement of faulty PV Modules, floaters used for PV modules, nut, connections between floaters etc.	Months	36	O & M of floating platform blocks shall be as per schedule of Floater OEM's attached with tender enquiry. Minimum 2 nos. manpower is required for Floater Maintenance works like checking and tightening of HDPE nuts for floater connection and PV module Fasteners, cap fittings, cable tie locks etc. as per O&M manual of OEM. In case of any abnormilities observed in floating platform, the same to be informed immediately to OEM.	2	Semi-Skilled	47220.00	1699920
9	DRONE INSPECTION WITH THERMAL IMAGING OF FLOATING SOLAR PLANT	Months	36	Frequency of drone survey for thermography shall be weekly per block during the PG test period of the plant for period of three to four months and thereafter shall be monthly once per block during the regular O&M period. Experienced operator shall be made available for operating and conducting the regular Drone survey of the system as above till end of the O&M period. Mantaining and upkeep of the Drone with accessories such as Thermal Camera, software and hardware for obtaining and analysing the survey inpurts for O&M purpose shall be under scope of the O&M vendor. Necessary approvals shall be obtained from Owner (NTPC) for movement of the drone over the reservoir.	As per Requirement	As per Requirement	21083	758988
10	Annual maintenance of all transformers with respect to BDV measurement, PPM measurement and Oil filtering as required, DGA test, tightness of cables, earthing and hardwares, replacement of gasket, silica gel breather, paint touchup, arresting oil leakages and oil topup work of all transformers (33KV and aux transformers) and other related electrical works.	AU	3	Through OEM / competent testing agencies as approved by BHEL. All required tools, tackles, testing and measuring instruments, Oil filtration kit, DG set etc. to be arranged by vendor. The Annual Maintenance activities shall be carried out as per OEM schedule and will be measured only when all activities listed are completed. Payment for any Maintenance not carried out shall be deducted from O&M Contractor Bills.	As per Requirement	As per Requirement	178250	534750
11	Annual testing and calibration of 33 kV HT panel equipment such as VCBs, CTs, PTs, Numerical relays, electromechanical relays, MFMs, Energy meters, including the switchyard equipemnts installed near NTPC Simhadri sub-station and for metering equipment installed in Panel Room.	AU	3	Through OEM / competent testing agencies as approved by BHEL. All required tools, tackles, testing and measuring instruments, DG set etc. to be arranged by vendor. This shall be as per the schedule mentioned in O & M schedule.	As per Requirement	As per Requirement	130467	391401
12	Calibration of Weather Monitoring Station equipment	AU	2	Weather monitoring station equipment to be calibrated at IMD or OEM recommended labs as per calibration period of individual equipment as recommended by OEM.	As per Requirement	As per Requirement	61575	123150
13	Checking and re-filling of Fire extinguishers and sand buckets as required	AU	3	All the fire extinguishers to be checked for healthiness and re-filling to be carried out as and when required as per validity of fire safety.	As per Requirement	As per Requirement	12315	36945
14	Maintenance and Servicing of Airconditioners, Furniture, Water purifier, fans etc.	Months	36	Complete maintenance and servicing of equipment as and when required to be carried out by vendor.	As per Requirement	As per Requirement	4504	162144
15	Painting of all metal structures (non-galvanized), PEB Rooms, rolling shutters, switchyard and transformer yards fencing and gates etc.	AU	3	Painting of all metal structures shall be carried out once in every year.	As per Requirement	As per Requirement	30187	90561

[illegible]



**TECHNICAL SPECIFICATION FOR  
OPERATION & MAINTENANCE FOR 25 MW(AC)  
FLOATING SOLAR PV POWER PLANT AT NTPC,  
SIMHADRI (AP)**

PS-439-1371

Rev No: 00

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***TECHNICAL SPECIFICATION FOR  
OPERATION & MAINTENANCE FOR 3 YEARS  
OF  
25 MW (AC) FLOATING SOLAR  
PHOTOVOLTAIC GRID-CONNECTED POWER  
PLANT  
AT  
NTPC SIMHADRI  
(ANDHRA PRADESH)***

Revision details: 00	Prepared  VKC	Approved:  MS	Date: 28.04.2021
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**TECHNICAL SPECIFICATION FOR  
OPERATION & MAINTENANCE FOR 25 MW(AC)  
FLOATING SOLAR PV POWER PLANT AT NTPC,  
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PS-439-1371

Rev No: 00

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**TECHNICAL SPECIFICATION FOR  
OPERATION & MAINTENANCE FOR 25 MW(AC)  
FLOATING SOLAR PV POWER PLANT AT NTPC,  
SIMHADRI (AP)**

PS-439-1371

Rev No: 00

## **1.0 INTRODUCTION:**

### **1.1 OVERALL PROJECT OUTLINE OF 25 MW FLOATING SOLAR PHOTOVOLTAIC POWER PLANT:**

Bharat Heavy Electricals Limited (BHEL), Solar Business Division, Bangalore is setting up 25MW Floating Solar photovoltaic (SPV) power plant for NTPC at Simhadri (AP) with Operation and Maintenance of 3 Years.

Solar PV modules employed at the plant, generates DC electricity that in turn shall be inverted to AC in the range 630V. The output voltage from inverter/PCU stepped up to 33KV level. The combined output at 33KV level shall be terminated in the Simhadri TPP switchyard which is approximately 4200 meters away. 3 runs of 33KV(E), 1CX240 sq.mm/Phase cables are laid between inverter transformer yards, and from local pooling stations up to termination points along with SCADA communication (OFC) cable from plant CMCS to switch yard panel room. From the outdoor switchyard, the cables are be taken to final termination at Panel Room close to the yard and terminated in available panels.

Solar PV modules are installed on the floating pontoons and joined together to make blocks. The 25MW-AC FSPV Project is made of 10 Blocks of 2.5MW-AC, each placed in the N-S Direction in the Raw water reservoir (Dead). These blocks rest on a mesh of Mooring ropes spaced at gap of 5m between blocks. The first 6 Blocks starting from the North side are of M/s Purshottam Profiles make and the last 4 blocks are of M/s Quant Solar make. Please refer detailed layout for more details. The mooring ropes are beneath the Array in the N-S Direction and in E-W Direction they emanate from the edge of the blocks and both the N-S and E-W ropes terminate at the bund. Hence the reservoir has a mesh of mooring ropes.

These blocks are located at 25mts from the East Bund wall. There is a float cable alley for every two blocks emanating from the gap between two blocks. This float alley takes the DC Cables from the individual blocks to the respective Inverter Rooms. There are total 5 Inverter rooms and DC cables from two adjacent 2.5 MW AC Blocks are clubbed and terminated to a single Inverter Room.

The plant is provided with infrastructural support systems such as weather monitoring system, plant illumination system, fire alarm system, Water washing system, Lightning arrestor system etc.

### **1.2 ENCLOSURES TO THIS TENDER SPECIFICATION (TENDER PURPOSE ONLY)**

1	Tentative AC single line diagram of overall Solar PV power plant
2	Tentative floating SPV plant layout on dead water reservoir
3	Tentative layout of main control room
4	Tentative route of underground transmission line and switchyard

## **2.0 LOCATION/ ADDRESS OF POWER PLANT:**

District Vishakhapatnam, Andhra Pradesh

Nearest Highway NH-5(12 km)

Nearest Railway Station Duvvada (12 km)

Nearest Commercial Airport Vishakhapatnam (12 KM)