

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Operation & Maintenance of 65MW SPV Power Plant
(40MW+25MW) of NLC, NEYVELI, TN.

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Volume-IA
Part I
Contract Specific Details

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Clause No	Description	
1	Project Details: M/s NLC Ltd is establishing 2 blocks (25MW, 40MW) of 65MW (AC) Grid Interactive Solar PV Plant on EPC basis at Neyveli, Cuddalore District, Tamil Nadu. BHEL has been awarded 1 block of 65 MW, which is divided in two different site with each of 40 MW & 25 MW respectively.	
1.1	Customer	M/s Neyveli Lignite Corporation Limited.
1.2	Project Information	1x65 MW(AC) Grid Interactive Solar PV Power Plant Area of 65MW block is divided into two sub blocks of 40MW and 25MW. The distance between these blocks is around 12kM.
1.3	Location	At Neyveli, Cuddalore District, Tamil Nadu. The site is 200 KM from Chennai.
1.4	Address Detail	Neyveli, Cuddalore District, Tamil Nadu.
1.5	Nearest Railway Station	Neyveli,
1.6	Road Approach	State Highway connecting Vridhachalam-Cuddalore and is about 18 KMs East of Vridhachalam and about 43 KMs South West of Cuddalore on Eastern Coast.
1.7	Nearest Air Port	Chennai
1.8	Ambient Air Temperature (Average)	a) Maximum : 40.0 ⁰ C b) Minimum : 18.4 ⁰ C
1.9	Average Relative Humidity	28-96 %
1.10	Climatic Condition	Tropical Climate
	Note: Bidder is advised to visit the project site and appraise himself about the local conditions and infrastructure available in the area for fulfilling their commitments under the contract. BHEL will not admit any claims whatsoever on account of Contractor's non-familiarization of local conditions.	
2	Project Details	
2.1	Project Information of 65MWp solar photovoltaic power plant:	

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	<p>Bharat Heavy Electricals Limited (BHEL), PE&SD, Hyderabad has set up a 65MWp solar photovoltaic (SPV) power plant at Neyveli, TN for NLC. The plant has two locations one of 40 MW at NLCIL Town ship and the other of 25 MW located at Koliruppu village, 12 kms apart from each other in Neyveli of Cuddalore district.</p> <p>An overview outline of the project is as follows:</p> <p>(a) The SPV modules employed at the power plant generates DC electricity that in turn is inverted to 3-phase AC with ~ 350V. The voltage is further stepped up to 33kV using 2.7MVA transformers. Twenty six such transformers are employed to achieve 65MWp. In which 16 nos. transformers are associated with 40MW block and 10 nos. transformers are associated with 25 MW</p> <p>(b) String monitoring boxes (SMBs, 549nos.) are employed to monitor the DC parameters of the strings of solar array. The DC power outputs from the SMBs are fed to 52 Nos of 1250kW grid-interactive power conditioning units (inverters) that are housed in a distributed manner among 11 PCSS rooms/inverter rooms and two PESS buildings/central control rooms. The PCSS room, each generating 5MWp, are placed at different locations of the power plant. Each such room is associated with a 33kV transformer yard, employing two oil-immersion transformers each of 2.7MVA, 33kV/350-350 V (one HV and two LV windings). Each LV winding voltage is expected to be in the range ~350V-380V.</p> <p>The 33KV output of 2 Nos of 2.7MVA transformers are fed to 33KV Switch boards with (2 I/C & 1 O/G) vacuum circuit breaker (VCBs) indoor panels are also placed in each PCSS room. The 33kV outgoing feeder from each PCSS will feed the 33kV switchboard at PESS. From PESS power generated is exported through Metering yard, Gantry to Grid. Thus, 7 PCSS rooms & 1 PESS room put together will generate 40MW in 40MW block and 4 PCSS rooms & 1PESS room put together will generate 25MW in 25MW block.</p> <p>(c) As per the above major equipment pertaining 40MW block and 25MW block are listed broadly below</p> <p>For 40MW block 333 SMBs, 32 PCUs, 7 PCSS, 1 PESS building, 16 Nos 2.7 MVA Transformer and 1Metering yard (2bays) & gantry.</p> <p>For 25MW block 216 SMBs, 20 Inverters, 4 Inverter rooms, 1 PESS building, 10 Nos 2.7 MVA Transformer and 1Metering yard (1bay) & gantry.</p> <p>i. Generated power from 40MW block will be exported through two-transmission line, each is sized for 40MW and Generated power from 25MW block will be exported through one transmission line. Each feeder line is supported by a 33kV metering yard comprising of outdoor-mounted equipment viz. CTs, PTs, surge arrestors, GOS isolators, earth switches, support structures, ACSR conductors etc. Each feeder line is provided with three ABT meters (main, check and standby) that are housed in independent panels kept in PESS room.</p> <p>ii. The parameters (DC solar array, LT AC inverter level, HT 33kV transformer level) of solar power</p>
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	<p>plant are monitored using SCADA system.</p> <p>iii. Power plant is provided with underground earth mat grid system for various electrical installations such as Solar array structures, string monitoring boxes, Inverter/PESS room electrical panels, Transformer yards, Metering yard and other installations.</p> <p>iv. 415V AC power for power plant auxiliaries is derived from 415V ACDBs located in PCSS room & PESS building. These ACDB will be further fed from 2x100% 350V/433V Auxiliary transformers. These Auxiliary transformers derive the power from output terminals of inverter.</p> <p>v. 110V DC supply for various electrical equipment such as protection relays, indication lamps etc. is derived from set of battery banks of Battery charger in PESS and PCSS rooms. The power supply to Battery charger is fed from auxiliary ACDB distribution panels.</p> <p>vi. 230V UPS power supply for various electrical equipment such as SCADA, PCUs, emergency lighting etc. is provided and are located in PESS and PCSS rooms. The power supply to UPS is fed from auxiliary ACDB distribution panels.</p> <p>vii. The plant has several other infrastructural support systems such as bore wells (for water supply), underground water pipeline network system for cleaning of SPV modules, lighting system for illumination of plant, fire alarm system for the inverter / PESS rooms, Inert gas fire protection system for SCADA, IP based telephone system, fire extinguishers, tools and instruments for operations and maintenance etc.</p>
2.2	Scope of the Work
2.2.1	The successful bidder shall provide Comprehensive Operations and maintenance of the complete plant for a period of (19) nineteen months for 40MW, and 25MW site Blocks at NLC, Neyveli, Tamilnadu. During O&M period, BHEL/ NLC personnel shall have unrestricted entry to the solar plant and Control Room any time. BHEL/ NLC may suitably depute its personals to associate with O&M activities. Contractor shall assist them in developing expertise through their day to day O&M activities. All records of maintenance must be maintained by the contractor which can be accessed by NTPC on demand. These records are to be handed over to NTPC after the O&M period of contract.
2.2.2	Coordination / liaison activities (related to clearance / approval) with concerned state/ Central authorities such as CEIG/CEA etc. including renewal of CEIG license during O&M period.
2.2.3	Providing all the resources not mentioned specifically but reasonably implied or necessary for the proper operation & maintenance, except in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provided by the BHEL engineer during the course of works.

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2.2.4	Complete accountability, and responsibility of round the clock security of the plant, periodic SPV module washing, grass cutting, landscaping, weed cleaning, shrubs removal, housekeeping of all the PEES, PCSS, and other places as specified by the BHEL Engineer and technical specification shall also be in the scope of the contractor. The scope of work, minimum labor/ resources required for these works, qualifications etc, are available in separate clauses of this TCC.
2.2.5	As this contract is for “Comprehensive Operation and Maintenance”, so all those works, which are not specifically specified in the contract but are required to carry out the safe and efficient operation of the plant then that work shall also be deemed to be included in the scope of work of the contractor. The term comprehensive encompasses all necessary services, T&Ps, testing equipments, supply of the consumables etc., whether explicitly stated or otherwise and that are necessary for the safe, secure, reliable and efficient operation of the Solar PV plant. Contractor shall always strive to operate the plant in the most safe and efficient way so that the plant availability and generation can be maximized. Safety of human beings and plant equipment shall always be at the forefront while operating the plant.
2.2.6	Site office for vendor use: Vendor shall necessarily establish Site Offices for 40MW and 25MW sites separately for their own purpose.
2.2.7	Electrical power / water for construction, drinking water: Vendor shall arrange, on their own, necessary electrical power supply such as DG sets, Service water, drinking water etc. required for Site office/staff/employees of vendor.
2.2.8	Furnishing samples of all materials required by the BHEL engineers for testing/inspection and approval for use in the works. The samples may be retained by the engineer for final incorporation in the works.
2.2.9	Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the BHEL engineer.
2.2.10	Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that are required for all works including temporary works.
2.2.11	Arranging manufacturer’s supervision for items of work done as per manufacturer’s specifications when so specified
2.2.12	Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract.
2.2.13	WORK BY OTHERS No work under the specification will be provided by any agency other than the contractor unless specifically mentioned elsewhere in the contract.

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	Note: For Further Detailed Scope Of Works Refer Relevant Technical Specifications Provided In The Subsequent Chapters In The TCC
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3.0	Facilities in the scope of Contractor			
S. No.	Description	Scope / to be taken care by		<i>Remarks</i>
		BHEL	Bidder	
3.1	ESTABLISHMENT			
3.1.1	FOR CONSTRUCTION PURPOSE:			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with customer(NLC)
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with customer(NLC)
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipments, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
f	Firefighting equipments like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	FOR LIVING PURPOSES OF THE BIDDER			
a	Open space for labour colony (as per availability)	Yes		Can be provided as per availability
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	ELECTRICITY			
3.2.1	Electricity For construction purposes			Not applicable
3.2.2	Electricity for the office, stores, canteen etc. of the bidder			
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc		Yes	
3.3.0	WATER SUPPLY			

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3.0	Facilities in the scope of Contractor			
S. No.	Description PART I	Scope / to be taken care by		<i>Remarks</i>
		BHEL	Bidder	
3.3.1	For construction purposes			Not applicable
3.3.2	<u>Water supply for bidder's office, stores, canteen etc</u>		Yes	
3.3.3	<u>Water supply for Living Purpose</u>		Yes	
3.4.0	LIGHTING			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3 At the construction site /area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER			
a	Téléphone, fax, internet, intranet, e-mail etc.		Yes	
3.6.0	COMPRESSED AIR wherever required for the work		Yes	
3.7.0	Demobilization of all the above facilities		Yes	
3.8.0	TRANSPORTATION			
a	For site personnel of the bidder		Yes	
b	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

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4.0	LIST OF TOOLS AND PLANT		
	The following tools and equipment but not limited to, are required for the efficient execution of the civil works. The contractor shall make them available for construction purposes, including all consumables likely to be used at his own cost at the time of mobilization.		
S.No.	Description	Minimum Quantity	Remarks
1.	Hydra	1	Need based
2.	JCB	1	Need based
3.	Tractor, and Trolley	1	Bidder must bring one tractor and trolley for resource movement across the plant for faster work execution
4.	Cable unwinding Machines, rollers etc	1 No	
5.	MC4 connector tool kit containing (1) crimping plier MC4, (2) open end spanner set MC4, (3) stripping plier MC4, (4) socket wrench insert to tighten, (5) socket wrench insert to secure, inserts for both 4 sq-mm and 6-sqmm (of both pliers).	2 Set	
6.	Electrical measuring instruments		
	a) Megger- 1 Kv	1 No	
	b) HV tester- 10 Kv	1 No	
	C) Logic probe	1 No	
	d) Modbus communication check kits	1 No	
	e) Digital multi meter	3 No	
7.	Tong testers	3 No	
8.	Digital power meters	1 No	
9.	Phase sequence meter	1 No	
10.	OFC termination kit, Splicing kits	1 Set	
11.	Primary / Secondary injection kit	1 No each	Need based
12.	Transformer oil filtration unit	1 No	Need based
13.	Earth resistance measuring kit	1 No	
14.	Lugs, glands	1 set	Need based
15.	Transmission line stringing equipment	1 No	
16.	DG sets	1 No	
17.	Cable jointing kit and associated tools	2 Set	
	Cable Fault detector / locator	1 no.	Need Based
18.	Welding equipment	1 No	
19.	Flood lights	5 No	
20.	Set of screw drivers	1 set	
21.	Set of Allen keys (mm & inch)	1 set	
22.	Small size hacksaw & fraksaw	1 set	

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23.	Cutting pliers	2 no	
24.	Nose pliers	2 no	
25.	Insulation strippers	2 no	
26.	Dry cable jointer	1 no	
27.	Number punches	1 no	
28.	Alphabet punch	1 no	
29.	Embossing machine with cassettes (Numbers and alphabets)	1 no	
30.	Portable drilling machine up to 1-1/2"	1 set	
31.	Soldering gun	1 no	
32.	Soldering Iron	1 no	
33.	Continuity tester	5 no	
34.	Double ended spanner Set of sizes 10-11, 12-13, 14-15, 16-17, 17-18	2 nos each	
35.	Crimping tool with Dye range 50- 400sqmm cable, mechanical gear power, hand operated	1 set	
36.	Crimping tool up to 6 sq-mm cable	1 set	
37.	Drilling machine AC, hand operated, with bit size up to 20 mm	1 set	
38.	Measuring Tape, 5m	2 no	
39.	Measuring Tape, 50 m	2 no	
40.	Adjustable spanner 2-inch size	1 no	
41.	Hammer	2 no	
42.	Rough file kit	1 set	
43.	Vacuum cleaner, of industrial type, for control room sweeping / cleaning.	1 no	
44.	Blowers for cleaning the panels	2 no	
45.	Grass cutting machine (Petrol/ Electric)	4 Nos	As per periodic grass cutting requirement
46.	Mini Tractor with rotary grass cutter	2 Nos	One each for 40MW, and 25MW Plant grass cutting activities
Note: BHEL will not provide any tool, plants or any testing facility/apparatus for the work. It will be contractor's responsibility to arrange all required tools, plants and other testing apparatus, etc. at their own cost. The prices quoted & finalized are inclusive of the charges towards providing such T&P. No extra payment will be entertained on account of this.			

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5.0	TIME SCHEDULE
5.1	The work of O&M for 40MW, and 25MW site Solar power plant is for a period of 19 (Nineteen) months.
5.2	During the total period of contract, the contractor has to carry out the activities in a phased manner as required by BHEL and the program of milestone events.
5.3	The work shall be commenced on the mutually agreed date between the bidder and BHEL engineer and shall be deemed as completed in all respect only when the unit is in operation. The decision of BHEL in this regard shall be final and binding on the contractor. The scope of work under this contract is deemed to be completed only when so certified by the site Engineer.
5.4	COMMENCEMENT OF CONTRACT PERIOD The date of commencement of the contract period shall be the mutually agreed date between the bidder and BHEL engineer to start the work. In case of discrepancy, the decision of the BHEL engineer will be final.
5.5	MOBILISATION i. The contractor should mobilize manpower in order to complete the work of O&M of 40MW, and 25MW site Solar power plant for a period of 19 (Nineteen) months as specified in the contract. ii. Requisite material, men and machinery should be arranged in order to complete the O&M work within the stipulated time.
5.6	The contractor has to augment his resources in such a manner that approved major milestones/ periodic maintenance activities of the O&M contract are achieved on specified schedules. In order to meet the schedule in general, and any other intermediate targets set, to meet customer/project schedule requirements, contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL
5.7	CONTRACT PERIOD: For the purpose of contract, the period shall be taken as 19 (Nineteen) Months for 40MW, and 25MW site Solar power plant.
5.8	PROTECTION OF WORK The contractor shall have total responsibility for protecting his works till it is taken over by the Employer. No claim will be entertained by the Employer or the representative of the Employer for any damage or loss to the Contractor's works and the Contractor shall be responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings. Should any such damage to the Contractor's Works occur because of other party not being under his supervision or control, the Contractor shall make his claim directly with the party concerned.

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	If disagreement or conflict or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damage to the Contractor's Works the same shall be rectified. The Contractor shall not cause any delay in the repair of such damaged Works because of any delay in the resolution of such disputes. The Contractor shall proceed to repair the Work immediately and no cause thereof will be assigned pending resolution of such disputes.
6.0	Taxes and Duties
6.1	For GST applicability please refer SCC Clause no.13
6.2	NA
6.3	NA
6.4	NA
6.5	NA
6.6	<p>BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998.</p> <p>In case any portion of work involves execution through building or construction workers, then compliance to the above titled Acts shall be ensured by the contractor and contractor shall obtain license and deposit the cess under the Act. In the circumstances it may be ensured as under:-</p> <ol style="list-style-type: none"> It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a license to the Competent Authority under the BOCW Act and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of license / permission to BHEL within a period of one month from the date of award of contract. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these act and rules including that of payment / deposit of 1% cess on the extant of work involving building or construction workers engaged by the contractor within a period of one month from the receipt of payment. It shall be the responsibility of the sub-contractor to furnish the receipts / challans towards deposit of the cess together with the number, name and other details of beneficiaries (building workers) engaged by the sub-contractor during the preceding month. <p>It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's</p>

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	Compensation Act, 1923. (building/Inter-state Migrant workmen) engaged by the sub-contractor during the preceding month. It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.
7.0	Running Account Bills Payment
7.1	The running account bills payment shall be made based on the work completed for the respective scope of as per the technical conditions of the contract.
7.2	In particular, the running account bills of the comprehensive O&M head shall be paid only after submission of all the O&M checklists, log sheets etc., duly certified by the BHEL engineer.

Volume-IB
Part II
Technical Specifications

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Clause no	Description
1.0	General
1.1	The work covered under this specification is of highly sophisticated nature, requiring the best quality of workmanship for operations and maintenance of a grid connected solar photovoltaic power plant. The Bidder should ensure timely completion of work. The Bidder must have adequate quantity of tools, tackles, equipment, work force, and other required resources etc., in his possession. He must also have on his rolls adequate, trained, qualified and experienced supervisory staff and skilled personnel to carry out safe and efficient operation and maintenance of both 40MW and 25MW plants.
1.2	All the work shall be carried out as per the instructions of BHEL engineer. BHEL engineer's decision regarding the acceptance, correctness of the work, and method of working shall be final and binding on the Bidder.
1.3	The Bidder shall, at its cost, perform any services, tests etc, although not specified but required for the completion of work.
1.4	All the necessary certificates and licenses required to carry out this work are to be arranged by the Contractor expeditiously at his cost.
1.5	The work to be carried out under the scope of these specifications covers ,temporary storing of contractor's own material, using the same in the work, carrying out all other activities, as defined in the scope of work enumerated in chapter-2, Part-I of TCC document, Bill of Quantities and elsewhere till handing over of the entire work. If any portion of the repair/ maintenance work is found to be defective in workmanship or not conforming to drawings or other specifications, the Contractor shall dismantle and re-do the work duly replacing the defective materials at his cost failing which the work will be got done by BHEL at the cost and risk of the contractor.
1.6	The terminal points as decided by BHEL shall be final and binding on the Contractor.
1.7	During the course of execution of this work, certain rework/ modification/ rectification during site operation/maintenance requirements. Contractor shall carryout such rework/ modification/rectification/fabrication/repairs etc., promptly and expeditiously. Claims of contractor, if any, for such works will be dealt as per relevant clauses of General Conditions of Contract.
1.8	Daily log sheets, O&M checklists/documents indicating the details of work carried out, man-hours, consumables used etc, shall be maintained by the Contractor and got signed by BHEL engineer every day. Failing to do so shall attract penal action from BHEL in the form of deductions from running account bills.
1.9	All tools and tackles, fixtures, equipment, materials, manpower, supervisors/ engineers, consumables etc. required for this scope of work shall be provided by the Contractor. All

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	expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause.
1.10	The contractor shall make adequate security arrangements including employment of security personnel and ensure protection from theft, fire, pilferage, damage and loss of materials/equipment of the plant. Special care will have to be taken to guard against pilferage / theft. The details of the security requirement is available in a separate clause of this specification.
1.11	Contractor shall ensure proper housekeeping and remove all scrap materials periodically from various work area covered in the scope and deposit the same at the place earmarked for this purpose. In case of contractor's failure to do the same, BHEL reserves the right to remove scrap at contractor's cost and risk.
1.12	Access to site for inspection by BHEL and customer engineers shall be made available by the contractor at all times.
1.13	Site Inspection: The owner / employer or his authorized agents may inspect various stages of work during the period of the contract awarded to him. The contractor shall make necessary arrangements for such inspection and carry out the rectification pointed out by the owner / employer without any extra cost to the owner / employer. No cost whatsoever such duplication of inspection of work be entertained.
1.14	BHEL will not supply any materials unless otherwise specified.
1.15	Makes of supply of cement, steel and painting materials (if any) shall be as per approved material list by NLC/BHEL.
1.16	The Contractor shall carry the work as per the Field Quality Plan/O&M plan issued by BHEL/NLC.
1.17	Calibration of equipment should be done by NABL/NPL accredited laboratories.
1.18	Welding procedure to be followed as per Field Quality plan. (Welding procedure and prequalification of welder required to be produced)(If required).
1.19	Contractor should submit the royalty certificates (If any) for quantity of Coarse and fine aggregates used at site.
1.20	O&M Checklists/ Field Quality Assurance Formats: It is the responsibility of the contractor to collect and fill up the relevant O&M checklists/FQA Log sheets and present the same to BHEL after carrying out the necessary checks as per the log sheets and obtaining the signature of BHEL / Customer in token of their acceptance. Monthly Running Bill Payment to the contractor will be linked with the submission of these Log sheets.

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1.21	Regular operation and maintenance of the Solar PV Power Plant and including water supply system and submission of daily performance data of the power plant. The Contractor shall maintain logbook in this respect, to record the date of checking & comments for action taken etc.
1.22	Proper records of operation of Power Plant System are to be kept as per direction of NLC/ BHEL.
1.23	Cleaning of the Power Plant including array yard on regular basis as per the instruction of BHEL Engineer, and technical specifications.
1.24	Normal and preventive maintenance of the Power Plant such as cleaning of module surface, tightening of all electrical connections, Line accessories, Transformers and associated Switchgears.
1.25	Recording and Keeping daily log sheet as per approved format for the Power Plant.
1.26	Under no circumstances, the operator shall run the power plant in such a manner which may damage the substation or Grid.
1.27	The Contractor shall submit monthly Performance report of Solar PV Power Plant indicating cumulative energy export data as per approved format within three days of the following month. The reporting shall also include any mismatch or abnormality in the performance of the power plant based on SCADA details review. Day to day coordination with TANGEDCO /RRVPLN authorities (as the case may be) and sending details required by them are also under the scope of the O & M contract.
1.28	The Contractor shall preserve all recorded data in physical as well as digital format and shall submit to NLC every month.
1.29	The Contractor shall maintain the garden, and landscaping including daily watering and manuring as and when necessary and on regular basis as per the directions of the BHEL Engineer.
1.30	During operation and maintenance period, the Contractor shall refill (Including testing and calibration) the fire extinguishers as per manufacturer's recommendation before expiry. The fire bucket filling and painting of fire bucket and stand shall be in the scope of the contractor. The price quote shall include all these requirement.
1.31	Vendor shall provide uniforms for the O&M staff.
1.32	O&M personnel shall be provided with raincoats, toolsets, earthing rods, safety gloves, safety goggles, gumboots, helmets and all other personal protective equipment (PPE) that will be relevant to ensure human safety.

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1.33	Maintenance personnel shall be in position to check and test all the equipment regularly, so that, preventive maintenance could be taken well in advance to save any equipment from damage. Abnormal behaviour of any equipment shall be brought to the notice of BHEL/ NLC not later than 2 hours for taking appropriate action.
1.34	Names, qualification, work responsibility of personnel shall be listed on a display board within control room.
1.35	Calibration of ABT energy meters, Pyranometers /WMS shall be in the scope of the O&M contractor.
1.36	The O&M contractor shall Ensure all danger boards, safety instructions, any other statutory instruction in Tamil, Hindi and English languages.
1.37	The O&M contractor shall Ensure Labour license, Compulsory PF ESI, and any other statutory requirements are to be complied without any lapses.
1.38	Resolution of any strike/ agitation, police complain for theft, unrest amongst vendor's manpower shall be under contractor's scope. In case the contractor fails to stop the strike/ agitation of its workers, the BHEL Engineer shall recover the losses from running account bills appropriately. Any kind of strike/ agitation, attributable to contractor's workforce, shall attract a penalty of 0.05% of the contract value per day, limited to 10% of the contract value.
1.39	The O&M contractor shall ensure the availability of consumables like insulation tape, straight through lugs, heat shrinkable (6 sq. mm), grease, sealant, cotton waste, emergency torch lights in sufficient quantity to ensure smooth O&M.
1.40	De-watering pumps to be arranged by contractor to remove water from cable trench as and when required.
1.41	The O&M contractor shall ensure the repair of damaged furniture, PEB building (Minor repairs as instructed by BHEL engineer)
1.42	Permit to work to be maintained by contractor as per NLCIL format.
1.43	Maintenance of records as instructed by BHEL engineer, printing and ensuring checklist documents for maintenance activities, daily, monthly, quarterly, annually, note book, register, format printing shall be in contractor's scope.
1.44	The O&M contractor shall keep sufficient number of FO repairing kits (Splicing kit, signal detector etc.) to ensure uninterrupted Communication.

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1.45	Deduction of payment shall be made for non-keeping of tools and tackle, maintenance equipment based on the downtime hours as decided by the BHEL engineer.
1.46	The O&M contractor shall install biometric machine attendance system at both 40MW and 25MW Solar site for attendance of its manpower. The report of biometric attendance system shall be submitted with attendance register. The cost of this shall be included in the quoted rates.
1.47	The maintenance of the CCTV shall be in the scope of the O&M contractor.
1.48	The O&M contractor shall carry out the minor repairing of PE building, arresting water leakage, repairing of windows, doors, shutter, exhaust fan side opening, trench covers, de-watering from trench during rain if any. The repairs in this clause shall be of minor nature and as per the directions of the BHEL engineer.
1.49	The O&M contractor shall carry out the Repairing of Fencing, module washing system, telephone system, SCADA system. If the repair is major and requires material supply, then material supply shall be in the BHEL scope.
1.50	In case of theft of cables/ equipment / any other property of BHEL, the contractor shall replace with the new one and fix the system to healthiness by mobilizing additional resources. In case of failure, BHEL will get the work (Incl. Supply) at the risk and cost of the contractor as per the relevant GCC clauses.
1.51	Any loss of plant and equipment due to fire incident occurred due to dry grass available in plant shall be recovered from O&M contractor. The removal of debris shall be carried out accordingly.
1.52	BHEL / NLC shall have right to disallow any O&M employee, if found unfit to perform. BHEL instructions issued in writing shall be binding on vendor who shall replace the person.
1.53	O&M personnel at site shall conform to general regulations in force at site and to any special instructions from local NLC administration.
1.54	O&M personnel at site shall be deemed, to be aware of damages and risks incidental to conditions of NLC land & works from time to time and BHEL / NLC shall not be responsible for any injury to personnel arising there out of that.
1.55	Training to O&M personnel It is the absolute responsibility of vendor to ensure imparting of necessary training to their O&M personnel to get them acquainted with the operations of various electrical and mechanical equipment of the power plant.
1.56	Availability of O&M personnel at power plant

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	<p>(a) Contractor shall ensure the round the clock availability of the O&M working level staff for uninterrupted, safe, and efficient operation of the plants (25MW, and 40MW both).</p> <p>(b) Vendor shall ensure that certain minimum operating staffs are present at the power plant even on festivals, public holidays and any other unique occasions so that the plant is run under competent supervision on all days.</p>			
1.57	O&M personnel shall, strictly, not use any part of the power plant for their personal / residential purposes. Their presence at the plant shall, strictly, be meant only for the purpose of operation and maintenance of plant.			
1.58	<p>SCOPE OF CIVIL MAINTENANCE:</p> <ol style="list-style-type: none"> Cleaning of surface drain, sewerage line, drainage outfall, down pipes, soil pipes, water pipe lines. Repairing or replacement, whatever necessary, and cleaning of all joineries in the Pre Engineered Building of PCSS as and when necessary. Repairing or replacement, whatever necessary, of doors, window fixtures, toilet accessories, etc in PESS and other buildings as and when necessary. Cleaning & maintaining of power plant area clearing all weeds, leaves and other wood Rejects. Painting (Incl. Supply of the paint) of iron parts of array structures posts once in a year. Painting (Incl. Supply of the paint) of PCSS, PESS, Security room, compound wall, fencing, gates, etc once in two years. All minor repair maintenance in case of buildings and all other structures as and when required as per the instructions of BHEL Engineer. 			
1.59	<p>Tools & Tackles , Measuring Instruments :</p> <p>Tools and Tackles are not supply items. Tools and Tackles which are required for O & M are to be supplied by the Contractor for use during the O & M period and the same can be taken back by the Contractor after completion of O & M period. The contractor shall maintain all regular operation and maintenance tools apart from the tools and tackles listed below.</p>			
1.59.1	Sl.No.	Item Description	Unit	Quantity
	1.	Insulation tester 500V (Megger)	No.	1
	2.	Insulation tester 5000V (Megger)	No.	1
	3.	Earth tester	No.	1
	4.	Digital Tong tester	No.	1
	5.	Digital Multi-meter with Graphic display	No.	1
	6.	Tool box with D / Ring spanner sets, socket wrench with sockets, insulated cutting & nose pliers, insulated screw	No.	1

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	drivers, pipe wrenches, Allen key wrench set, MS files, hammer, crowbar, steel tape, etc.		
7.	Crimping tool (2.5 to 240 sq mm)	Set	1
8.	Insulation stripper	Set	1
9.	Analog multi meter	No.	1
10.	Analog tong tester (AC/DC)	No.	1
11.	Relay Tools Kit	Set	1
12.	Electronic Relay Testing Kit	No.	1
13.	Torque Wrench	Nos.	2
14.	Breaker lifting / handling truck of each type	No.	1
15.	Fuse pullers of each type	No.	5
16.	PV Array Tester	No.	2
17.	IR Hand-held Temperature Scanner	No.	1
18.	Temperature Indicator	No.	1
19.	Solar Module Cleaning Kit	No.	4
20.	Rheostat	No.	1
21.	C.R.O	No.	1
22.	Function Generator	No.	1
23.	Inverter Testing Kit	No.	1
1.59.2	The contractor shall maintain all regular operation and maintenance tools apart from the tools and tackles listed above. Such special tools and tackles used by the contractor during operation and maintenance period shall be handed over to NLC at free of cost, to ensure smooth takeover of the plant by NLC from the contractor at the end of O& M period.		
1.59.3	Bidder shall provide all details of onsite testing instruments / equipment. Details of equipment / instrument, make, numbers, range, accuracy, etc. shall be furnished to NLC.		
1.60	O&M operations – daily basis <ol style="list-style-type: none"> (1) All the preventive, normal maintenance activities as per approved plans, and schedules. (2) Attending, and repairing cable faults, equipment failure, or any other such events which may hinder the efficient operation of the plant. (3) Water cleaning of SPV modules (4) Inverter room / PESS room cleaning – dry sweeping, wet mopping (5) Water wash cleaning of toilets, urinals (6) Gardening of landscaping areas: watering of plants, trimming of plants as applicable and necessary. (7) Logging of DC, AC, grid parameters (current, voltage, power, energy) at PCUs & VCB panels, transformer temperatures, equipment tripping/ breakdown, grid outage etc as per BHEL formats. 		

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	<p>(8) SCADA data station / PC operations for daily monitoring of weather parameters, trend graphs and urgent reporting to BHEL/NLC in case of any problems / anomalies observed with any of the parameters.</p> <p>(9) Drinking water to be arranged for O&M personnel at site.</p>
1.61	<p>O&M activities – weekly basis</p> <p>(1) Removal of garbage from solar array field, switchyard, roads, drains, pathways, sand buckets; logging in registers with signatures of operating persons and in-charge.</p> <p>(2) Monitoring and logging of fire extinguisher levels / pressures as per BHEL formats</p>
1.62	<p>O&M activities – monthly basis</p> <p>(1) Inspection of fire extinguishers (weight, pressure indication, physical status etc.) followed by refilling actions, if necessary, based on indications. Report to be submitted as per BHEL approved recording formats.</p> <p>(2) Earthing resistance measurements for solar array structures, control room equipment, switchyard equipment, and lightning arrestors: measured values shall be recorded in registers and reported to BHEL as per BHEL approved recording formats.</p> <p>(3) Submission of values / status of plant parameters and events for the corresponding month, as below, as per BHEL approved formats:</p> <ol style="list-style-type: none"> Daily values of solar array strings (SMB parameters) Daily values of weather parameters (solar energy, wind speed, ambient temperature) Daily energy generation Events (with date, time) of faults / tripping / breakdown of equipment Events (with date, time) of grid outage Events (with date, time) of equipment damages, accidents and thefts Activities of module cleaning <p>(4) Monthly reports shall be submitted to BHEL for all the above data.</p> <p>(5) The month wise net energy export calculation for first five years shall be furnished by the by the vendor in the following format.</p>
1.63	<p>Guaranteed Month-wise Energy Export of the project at 33 KV outgoing feeders in metering stations of NLC take off point as per below</p>

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	Sl.No.	Month	Average Global Radiation on horizontal surface Considered (kWh /M2 / Day) Month wise.	1st Year (kWh)	2 nd Year (kWh)			
	1.	January						
	2.	February						
	3.	March						
	4.	April						
	5.	May						
	6.	June						
	7.	July						
	8.	August						
	9.	September						
	10.	October						
	11.	November						
	12.	December						
		Annual						
1.64	Note: <ol style="list-style-type: none"> The basis and reference standards used for arriving at these data shall be furnished. PV System Design Report with simulation parameters / variants, shading diagrams, production charts, loss diagrams, etc. shall be furnished correlating with the above month wise energy export data. For each 33KV outgoing feeder, the above calculation shall be done separately and then by adding all the 33 KV outgoing feeder values of the project, the net energy Export value for the project shall be calculated. 							
1.65	O&M activities - quarterly basis <ol style="list-style-type: none"> Cleaning of PCUs, LT panels, VCB panels, UPS panels etc to remove accumulated dust. Monitoring and status review, followed by rectification / calibration / replenishment / replacement actions as necessary and applicable for following: <ol style="list-style-type: none"> Spare items of all electrical equipment First aid box items - medicines and accessories Safety gadgets Tool kits and measuring instruments Yard lights Pumps, starters Control room appliances: air conditioners, lights, fans, exhaust fans, switch boards etc Pest control for control room (rats, snakes etc) – sprays, chemicals, medicines etc to be applied wherever required. 							

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	(4) Submission of quarterly report on above activities to BHEL.
1.66	O&M activities – half yearly basis Cleaning of water storage tanks.
1.67	O&M activities – yearly basis (1) BDV measurements for oil samples from all the transformers and submission of report to BHEL / NLC. (2) Filtration of oil to be arranged, if required, based on BDV measurement report. (3) Lubrication of moving contacts (VCBs etc) with appropriate grease etc (4) Cleaning of sewerage lines, septic tanks (if found necessary) (5) Painting of main gate, switchyard gate / fencing, earthing chambers, other steel structures within control room and switchyard if required based on conditions of rusting etc. (6) Checking tightness of hardware in solar array structures and tightening wherever required. (7) Checking tightness of power cable terminations in SPV modules (MC4), SMBs, electrical panels of control room and switchyard.
1.68	O&M activities - as and when required (contextual basis) (1) Monitoring and operation of plant electrical equipment as and when required: (a) VCB on/off: local operations from outdoor VCB panel and remote operations from SCADA system. (b) Settings of numerical relays in VCB panels: review and revision in consultation with BHEL. (c) ACB and MCCB on/off operations on LT side (d) PCU operations: emergency close, LCD displays (selection of settings, monitoring the DC/AC/event/fault status parameters), operation of duct fans (e) UPS panels and Battery bank operations (f) Bore well pump operations to fill the water storage tanks (2) Coordinating, on behalf of BHEL, and obtaining renewal of statutory licenses, clearances and approvals from state departments such as electricity boards, CEA/CEIG etc. (3) Repair and replacement of vendor supplied items, by vendor, with urgent action plans and implementation, when the items are found non-working / damaged. The same shall be reported to BHEL within 12 hours from time of observation. (4) Reporting, on an immediate basis (within max 2 hours) of functional problems / damages in BHEL supplied items to facilitate repair / replacement by BHEL. Further, vendor shall correspond / coordinate with respective equipment vendors / service centers, on behalf of BHEL, for getting the service engineers to the site. Later, coordinating with the service engineers during their visit to site, and assisting them in the trouble shooting process until the problem is resolved. Vendor shall report to BHEL (within max 2 hours) immediately after the problem is resolved.

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	<p>(5) Vendor shall keep updating the spares inventory at the site every time there is consumption of spare items towards replacement. In case of shortage of spares, the same shall be reported on an urgent basis (with max 2 hours) to BHEL.</p> <p>(6) Coordinating with sub-station upon grid failures, line problems etc and implementing the needful steps to restore the plant to normal operation.</p> <p>(7) Theft incidents: immediate reporting to BHEL, filing FIRs with police stations on behalf of BHEL, coordination for site inspection by insurance companies and clearance of insurance claims, logging of events (date, time) and maintaining records.</p> <p>(8) Accidents: immediate reporting to BHEL, coordinating with hospitals, logging of events (data, time) and maintaining records.</p>
2.1	<p>O&M PERSONNEL</p> <p>The maintenance personnel shall be in a position to check and test all the equipment regularly, so that, preventive maintenance, could be taken well in advance to save any equipment from damage. Abnormal behavior of any equipment shall be brought to the notice of NLC not later than 2 hours for taking appropriate action. The vendor shall deploy the following minimum personnel (Separately for 40MW, and 25MW Plants):</p>
2.1.1	<p>Two (1 for 40MW, and 1 for 25MW) technical-cum-administrative Site In-charge having diploma/ graduation, in electrical / electronics engineering and experience with overall responsibility for complete plant operations. The in charge shall have the competence to deftly handle technical and operational / crisis problems.</p>
2.1.2	<p>Minimum Fourteen (8 for 40MW, and 6 for 25MW) numbers working level staff with ITI / diploma level/ Higher level qualifications in engineering with competence for operating electrical / electronics / mechanical equipment, taking measurements, data logging/maintaining registers, and preparation of reports in computer. The working level staff shall be operating in the shifts as instructed by BHEL engineer for the safe and efficient operation and maintenance of the plant.</p> <p>In case the contractor fails to provide the minimum number of working level staff for plant O&M, BHEL shall deduct Rs. 40000/ per month + 5% admin charges per person (Or on pro-rata basis for lesser time period) from the running account bills of the contractor.</p> <p>If the contractor fails to provide the minimum number of working level staff for a long period, BHEL will deploy the working level staff at risk & cost of the contractor as per the relevant GCC clauses.</p>
2.1.3	<p>Minimum Eighteen (10 for 40MW, 08 for 25MW) numbers of unskilled persons for regular housekeeping (cleaning/ mopping etc), module washing, grass cutting, landscaping, weeding, and other relevant works. 2 Nos each unskilled manpower for 40MW and 25MW plants i.e. total 4 Nos, shall be dedicated for housekeeping activities only.</p>

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	<p>In case the contractor fails to provide the minimum number of unskilled manpower for plant O&M, BHEL shall deduct Rs. 20000/ per month + 5% admin charges per person (Or on pro-rata basis for lesser time period) from the running account bills of the contractor.</p> <p>If the contractor fails to provide the minimum number of unskilled manpower for a long period, BHEL will deploy the working level staff at risk & cost of the contractor as per the relevant GCC clauses.</p>
2.1.4	Two (1 for 40MW, and 1 for 25MW) safety officers with relevant experience and educational qualifications.
2.1.5	Note: At least two among the technical personnel shall essentially be a certified /licensed person for HT operations (33kV minimum). This is a mandatory requirement.
2.2	Module Washing
2.2.1	40MW Site: There are total 7104 number of tables in the 40MW plant. All 7104 tables are to be cleaned and washed every 15 days (Module Washing cycle) as per the directions of the BHEL Engineer. In case the contractor fails to wash the modules as per the module washing cycle, the payment shall be made on pro-rata basis for the cleaned no. of tables, as per the price schedule. The uncleaned tables shall not be claimed in the next washing cycle. The subsequent washing cycle shall start a fresh, and payment shall be made basis tables cleaned in that particular cycle.
2.2.2	25MW Site: There are total 4685 number of tables in the 25MW plant. All 4685 tables are to be cleaned and washed every 15 days (Module Washing cycle) as per the directions of the BHEL Engineer. In case the contractor fails to wash the tables as per the module washing cycle, the payment shall be made on pro-rata basis for the cleaned no. of tables, as per the price schedule. The uncleaned tables shall not be claimed in the next washing cycle. The subsequent washing cycle shall start a fresh, and payment shall be made basis tables cleaned in that particular cycle.
2.2.3	The contractor shall ensure the availability of sufficient number of water spray guns, water hoses, and other consumables like mops etc.
2.3	Grass cutting, weeding, shrub removal etc.
2.3.1	<p>40MW Plant: The plant is divided into 7 PCSS areas. The contractor shall clean the solar array area of all the PCSS every two-month (Cycle time) to keep the grass upto 500mm height approximately. The item rate of the grass cutting shall be divided into seven equal units, and that unit rate shall be used for the payment of one PCSS Solar array area.</p> <p>The payment of the grass cutting shall be made every two month. In case the contractor does not complete the grass cutting in all the 7 PCSS array areas, the payment shall be made on pro-rata basis as explained above. The PCSS area, which is completely cleaned by grass cutting,</p>

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	<p>shall be considered for the payment. The incomplete PCSS area shall not be considered for any payment.</p> <p>The contractor shall primarily use tractor mounted rotary cutter for grass cutting activity, to ensure fast and safe execution.</p> <p>The incomplete PCSS area shall not considered for payment in the subsequent grass cutting cycle also. The next grass cutting cycle shall start a fresh.</p> <p>In case contractor fails to perform the activity as per the contract requirement, BHEL shall get the work done at risk & cost of the contractor as per the extant GCC clauses.</p>															
2.3.2	<p>25MW Plant: The plant is divided into 5 PCSS areas. The contractor shall clean the solar array area of all the PCSS every two-month (Cycle time) to keep the grass upto 500mm height approximately. The item rate of the grass cutting shall be divided into seven equal units, and that unit rate shall be used for the payment of one PCSS Solar array area.</p> <p>The payment of the grass cutting shall be made every two month. In case the contractor does not complete the grass cutting in all the 5 PCSS array areas, the payment shall be made on pro-rata basis as explained above. The PCSS area, which is completely cleaned by grass cutting, shall be considered for the payment. The incomplete PCSS area shall not be considered for any payment.</p> <p>The contractor shall use mini tractor mounted rotary cutter for grass cutting activity, to ensure fast and safe execution.</p> <p>The incomplete PCSS area shall not considered for payment in the subsequent grass cutting cycle also. The next grass cutting cycle shall start a fresh.</p> <p>In case contractor fails to perform the activity as per the contract requirement, BHEL shall get the work done at risk & cost of the contractor as per the extant GCC clauses.</p>															
2.4	Security of the plant (25MW, and 40MW)															
2.4.1	<p>Security of the Solar Power Plant (25MW and 40MW) and respective PESS will rest solely on contractor till the O&M period (i.e 19 months from the date contract commencement) of the power plant. Deployment of security guards during O&M period shall be in scope of contractor. Presently, a separate security contract is under execution at NLC 65MW (Both 40MW, and 25MW) site. The requirement of the security services under this technical specification shall start from January 2024, tentatively (1 Month earlier/ later). BHEL shall intimate the contractor to start the security services at 40MW , and 25MW sites two weeks before the deployment requirement.</p>															
2.4.2	<p>Following will be the minimum manpower deployment requirement for security services:</p> <table><tr><th>Sl No</th><th>Description</th><th>Qty for 40MW (Nos)</th><th>Qty for 25MW (Nos)</th><th>Total (Nos)</th></tr><tr><td>1</td><td>Security Supervisor</td><td>1</td><td>1</td><td>2</td></tr><tr><td>2</td><td>Security guard</td><td>34</td><td>18</td><td>52</td></tr></table>	Sl No	Description	Qty for 40MW (Nos)	Qty for 25MW (Nos)	Total (Nos)	1	Security Supervisor	1	1	2	2	Security guard	34	18	52
Sl No	Description	Qty for 40MW (Nos)	Qty for 25MW (Nos)	Total (Nos)												
1	Security Supervisor	1	1	2												
2	Security guard	34	18	52												

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		3	5 Seater, 4 Wheeler patrolling vehicle (Incl. Driver, fuel, and maintenance cost), not older than 2019 model	1	1	2
2.4.3	Terms and conditions for security services:					
2.4.3.1	To provide security services in the premises of 1x65 MW Solar PV Power Project, Neyveli, Cuddalore district, Tamilnadu (Two geographically separated sites of 40 MW & 25 MW each) round the clock in three shifts on all days of the week including Sundays & Holidays by deploying 52 guards (34 for 40 MW site + 18 for 25MW site), 2 Supervisors (1 each for 40 & 25 MW site), patrolling vehicle (1 for each site).					
2.4.3.2	If the contractor fails to deploy requisite no. of security personnel's, Patrolling vehicle as mentioned above as per the mutually agreed plan, BHEL reserves the right to deploy the same through any other agency and the additional cost of such deployment shall be recovered from the contractor's invoice along with 5% departmental charges, without prejudice to BHEL's right to invoke relevant clauses of the GCC.					
2.4.3.3	Tentative Shift timings for security guards will be as follows: First shift: 0600 Hrs. to 1400 Hrs, Second shift: 1400 Hrs. to 2200 Hrs. Third shift: 2200 Hrs. to 0600 Hrs.					
2.4.3.4	Patrolling by patrolling vehicle will be done as follows: Patrolling Vehicle will be deployed from 06:00 PM to 06:00 AM one vehicle each for 2 sites. Patrolling will be done at least for every one hour covering all internal roads and peripheral road. Minimum of 12 Rounds of Patrolling will be done in the mentioned period of 06:00 PM to 06:00 AM					
2.4.3.5	Security personnel will have to take all measures for security of our premises including all equipments, appliances, furniture, machinery, fixtures, fittings, office records, etc. for which guards deployed for duty will have to remain vigilant and alert. In case of loss of any items due to theft/pilferage, the contractor will have to take necessary action and comply with all formalities required under Law and lodge FIR with Police to enable BHEL process the insurance claims and to recover the lost properties. The Security personnel shall be responsible for safeguarding items. In case of emergency, the security guards should be able to handle / operate the Fire Fighting equipments located at the company premises. One patrolling vehicle (1 for each site) will be deployed for patrolling.					
2.4.3.6	The contractor has to ensure the availability of minimum specified number of security guards distributed in the shifts as per the directions of the BHEL engineer. There will be no extra payment for holidays, leaves etc.					
2.4.4	Security Supervision & Control:					
2.4.4.1	BHEL 1x65 MW Solar project for NLC at Neyveli site (hereinafter called 'Company') shall nominate one or more of its employees for the proper implementation of the contract and to issue					

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	instructions to the Agency, M/s----- (hereinafter called as 'Contractor') on behalf of the company.
2.4.4.2	The officer so nominated by the Company shall exercise supervision and control over the Performance of the security agency. Any instructions issued by them shall be promptly attended to by the contractor and his security personnel.
2.4.4.3	The Contractor shall nominate one or more of its employees at the respective locations for the proper implementation of the contract and to issue instructions to its employees
2.4.5	Security Manpower Deployment:
2.4.5.1	The contractor shall provide security personnel, patrolling vehicles & Supervisors to carry out the duties under this contract.
2.4.5.2	No separate payment will be made by the company towards relievers for the personnel posted under this contract, since the charges payable includes weekly off/ leave/ National Holidays/ other holidays.
2.4.5.3	The contractor shall ensure that Guards/ Supervisors provided to the company are educated, of good moral character never having been convicted of a criminal offence by a court of law, physically fit without any permanent physical or mental disability and are under the age of 45 years.
2.4.5.4	Verification of Character and antecedents of the private security guard and supervisor. Before a person is employed or engaged as a security guard or supervisor, the Agency shall satisfy itself about the character and antecedents of such person by verifying the character and antecedents of the person by relying on the report received from the police authorities signed under the authority of the Superintendent of Police of the district concerned or an officer of the equivalent or higher rank.
2.4.5.5	The company may call for proof of fitness, including Police verification from the contractor in respect of any Guard/Supervisor and if necessary order the contractor to get any guard/supervisor medically checked by an authorized Company Doctor at the contractor's expense and withdraw him from duty if found unfit.
2.4.5.6	The contractor shall in respect of each employee supply to the company on the following information: Name, Father's Name, Date of Birth, Educational qualification, two identifying body marks, full residential address and passport size photograph.

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2.4.5.7	The contractor shall not substitute a Guard/ Supervisor with another without the approval of the company.
2.4.5.8	The contractor shall provide each employee with an identity card with photograph.
2.4.5.9	The contractor shall ensure that security personnel provided by him to the company are not members of any trade union of the employees of the 'company' and they shall not interfere with the affairs of the company.
2.4.5.10	Security personnel provided by the contractor to the company shall not be company employees, but of the contractor for all purposes of the contract.
2.4.5.11	In case of necessity, the company may within 30 days' notice, ask the contractor to increase or decrease the staff as specified by the company and the contract value will be changed proportionately.
2.4.6	Duties: Security Guards, and patrolling vehicle. The following will the list of duties performed by the security personnel (List is tentative and not exhaustive)
2.4.6.1	To deal with company visitors, customer officials and employees courteously and politely and to maintain integrity, orderliness and discipline and be in proper prescribed neat and tidy uniform while on duty. Carry out all duties and tasks allotted by the competent officer/ supervisor sincerely and to the best of his ability.
2.4.6.2	To guard/patrol/check during day and night and ensure that no theft, pilferage, trespass, accident, nuisance, disturbance of peace and orderliness, etc. takes place in the area of his duty. To man entry points and regulate and check the flow of men, materials, transport vehicles, etc. and ensure that the entry/ exit is as per valid documents and records.
2.4.6.3	To apprehend immediately, produce before the supervisors any trespasser or person found in the area unauthorized and under suspicious circumstances.
2.4.6.4	To watch habitual offenders and mischief-makers and inform his supervisors, if anything unusual is noticed.
2.4.6.5	To seize goods not found in order or suspected to be stolen.
2.4.6.6	To see that fire equipment installed in the area under his watch is in working condition and bring to the notice of his superiors any defect or shortcomings.

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2.4.6.7	To bring to the notice of his supervisor or the competent BHEL officer any untoward occurrence on the premises, preferably in writing.
2.4.6.8	<ul style="list-style-type: none"> a) Night patrolling vehicle will be used as per the instructions given by BHEL site in charge. b) The vehicle (5 seater) deployed should have standard tools, first aid kit and stepony. c) The year of vehicle model should be 2019 or later. d) The vehicle will be maintained clean both inside & outside on a daily basis. e) In case of non-availability of vehicle for minor/major breakdown an alternative vehicle shall be arranged for maximum of seven days for minor breakdown and about twenty one days for major breakdown. However, the arrangement of alternative vehicle shall be allowed subject to fitness, roadworthiness and proper documentation of vehicle. If the alternative arrangement is continued beyond twenty one days, BHEL –Hyderabad reserves the right to terminate the contract and impose penalty of one month rental charges from the contractor. The vehicle provided in these conditions shall be of model not earlier than to existing. f) The contractor has to pay minimum wages to the drivers as per the Government notification from time to time considering driver as a skilled labour. g) The contractor shall submit the insurance of the car which includes the insurance of driver also (valid during the tenure of the contract) after the receipt of the work order. h) All expenses towards vehicle fuel, salary of drivers, repair & maintenance, engine oil, damages due to accident, comprehensive insurance, road tax, or any other renewals, etc. shall have to be met by owner of vehicle. i) The drivers so deployed must have valid driving license. Drivers so employed should not be under the influence of liquor or intoxicated during the duty hours. j) Refusal to perform duty by drivers will be treated as non –deployment of the vehicle for that particular day and deduction at the rate of three times as per day rental charges will be recovered. k) In case of misbehavior by the drivers, the contractor has to take immediate action and the decision of BHEL’s representative in this regard will be final and binding. l) The drive/contractor representative will meet BHEL’s representative regularly to get instruction regarding the deployment of the vehicle. m) Should the vehicle deployed meet with an accident, no claim on account of damage to the vehicle or the persons travelling in such vehicle including the employees of the contractor, drivers, cleaner of the vehicle shall be entertained by the company. n) Should the vehicle deployed by the contractor meet with an accident due to reasons attributable to the contractor or his employees and cause damage to the persons/property of the company, the contractor shall liable to make good such losses in the manner as prescribed by the company. o) The company shall further be entitled to recover the amount so paid by way of compensation under the aforesaid act or under any other deducting the sum from bill or from any other sum due to him.

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	<p>p) The bill along with log book/ trip sheet and any other documents as required by BHEL's representative will be submitted on completion of a month.</p> <p>q) The rate quoted by bidders shall be inclusive of monthly rental, fuel, night charges, driver salary, and regular maintenance.</p>
2.4.7	Duties of the Security Supervisor
2.4.7.1	To deal with all company visitors, customer officials and employees courteously and politely and maintain integrity, orderliness and discipline on the premises while on duty and be in proper prescribed uniform, exhibit proper courtesy and discipline and carry out tasks allotted by the competent officer of the company or the contractor in pursuance of the contract.
	Detail check, supervise regularly duties performed by security guards, and enforce good behavior and discipline.
	To apprehend immediately, produce before local police with due information to BHEL officer any trespasser or person found in the area unauthorized and under suspicious circumstances.
	To watch habitual offenders and mischief-makers and inform to Local police and BHEL officer, if anything unusual is noticed
	Bring to the notice of the concerned company officer preferably in writing, all important matters connected with contractual duties of the contractor immediately.
	Carry out liaison duties with the local police as required by the company official.
	Ensure that all security and firefighting equipment are secured in order and usable.
	To carry out the internal investigation or enquiry in case of theft/ fire, damage accident, etc. as required by the competent company official and send a report to the company official immediately.
	To maintain necessary documents as instructed by the competent company official within the scope of the contract and labor.
	To carry out any other duty assigned by the competent company official.
	To co-ordinate between supervisors with proper taking over and handling over checklist certified by BHEL representative and Contractor's representative.

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2.4.8	Scope of Security services of 40MW, and 25MW plants
2.4.8.1	The contractor shall arrange to post security guards/supervisors at such places and in such manner, that guarding patrolling search of incoming and outgoing vehicles and persons whenever necessary in the areas/premises is done throughout 24 hours of the day, as per the instructions of company officer.
2.4.8.2	In order to ensure that the security guards/ supervisors are able to discharge their duties, the contractor shall provide them with all necessary facilities in the form of batons, lathies, uniforms, shoes, socks, and other uniform items, torch lights, Rain Coats, etc. at his own cost.
2.4.8.3	Contractor shall supervise the performance of the security guard/ supervisors adequately and ensure that performance and turnout are such that the purpose of the contract is fully achieved.
2.4.8.4	The contractor shall visit the contractual area premises every week and meet competent company official or whenever specially called by the latter and carryout the tasks assigned efficiently diligently and to the satisfaction of the company.
2.4.8.5	The contractor shall be responsible for the orderly and disciplined behavior of his employees towards all, including company employees.
2.4.8.6	The contractor shall ensure that any dispute between him and his employees, i.e. supervisors and guards are settled outside the premises and he shall in no way utilize Company's premises, property, etc. for this purpose.
2.4.8.7	The contractor shall preserve all records maintained for the company and hand them over to the concerned official at the respective sites from time to time and positively at the end of the contract period. The contractor shall pay the wages to the security personnel as per the minimum wages fixed by the State Govt. / Central Govt. as applicable. The contractor shall issue salary slip to each employee every month indicating each component of payments and recoveries.
2.4.8.9	The contractor should ensure the payment of minimum wages fixed by the State Govt. or Central Govt. as applicable from time to time, to their security staff and comply the other statutory requirements, such as depositing contributions to concerned authorities regularly.
2.4.8.10	The photocopies of the bank challan for payment of PF/ESI contribution paid as applicable in respect of security personnel covered under this contract along with an extract of persons employed at the respective sites pertaining to the previous month shall be submitted by the contractor to BHEL along with monthly bill.
2.4.8.11	The contractor shall make available all the records required to be maintained under various statutes for verification by BHEL representatives as and when required.

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2.4.8.12	It will be open to BHEL to ask for replacement of any or all the staff if he/ they do not fully meet BHEL's security requirement. Alternatively, the contractor may withdraw his personnel for administrative reasons but they should be suitably replaced and be acceptable to BHEL if the guard/s are found in disciplined, he/they repatriated from the site immediately.
2.4.8.13	The contractor will give certificate that security personnel posted at the respective sites are your personnel and not drafted from other security agencies on deputation or attachment. Suitable certificate in this regard should be sent before deployment of security personnel at the respective sites.
2.4.8.14	The contractor will obtain a license before deploying the security personnel at respective sites as required under the Contract Labor (Regulation & Abolition) Act 1970 / Central and State Rules framed thereof and furnish a photo copy of the said license to the respective sites.
2.4.8.15	The contractor will issue employment cards in the prescribed form as required under Contract Labor (Regulation & Abolition) Act /Rules immediately on deployment of security personnel at the respective sites.
2.4.8.16	The contractor will also comply with all the provisions as applicable under Contract Labor (Regulation & Abolition) Act 1970/ Rules 1971 and State Act/ Rules framed there under.
2.4.8.17	The contractor shall ensure that security staffs attend duties in prescribed uniform only.