TITLE	AMENDMENT NO. 01 TO TECHNICAL SPECIFICATION
Package	Design, Engineering, Supply, Construction, Erection, Testing, and Commissioning of 4x300MW Khavda Solar PV plant along with power evacuation system excluding supply of PV modules & Trackers along with three-year O&M at KHAVDA RE Park.
Date	19.03.2025

1. PROVENESS

PROVENESS CRITERIA

The bidder/his sub-vendor(s) is required to meet the Proveness criteria and/or qualification requirement for critical component and bought out item as per the criteria stipulated below. The compliance to the Proveness criteria shall be considered by the owner on verification of the credential documents submitted by the main contractor under their company's/ firm's seal for it's authenticity & correctness in the attached format **(Annexure-1C-A)** for each proposed sub-vendor as per requirements mentioned below:

1. Solar Engineering Firm

If the bidder himself has not carried out the engineering of at least one (1) number of Solar PV Power Plant of capacity 10 MWp (minimum) which is in successful operation for the last six (6) months prior to the reference date mentioned below, the bidder shall employ an Engineering Firm who has engineered at least one (1) number of Solar PV Power Plant of capacity 10 MWp (minimum) at single location which is in successful operation for the last six (6) months prior to the following reference date:

Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.

The scope of work of engineering for the above project by the Firm shall necessarily include the following:

i. Selection and Sizing of:
   a. Inverter
   b. PV Modules
   c. DC Cables
ii. Finalization of Plant Layout with shadow analysis
iii. Energy Estimation

The Firm shall undertake at least the above scope of engineering for the proposed Solar PV Power Plant.

2. Solar Inverter Transformers

a) The Bidder/its Sub-vendor should have designed, manufactured and supplied transformers of 33kV or higher voltage class of cumulative capacity of 40 MVA or above, out of which at least one such supply order for a single plant should be of 10 MVA or above capacity. The reference plant in which transformers of 10 MVA or above capacity (consisting of one or more) were supplied, must have been in successful operation for at least six (6) months prior to the following reference date:

Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.

And

b) Bidder/its sub-vendor should have its own facilities for conducting all routine tests for transformers as per IS: 2026/IEC 60076.

And

c) 2.5 MVA, 33kV or higher rated inverter transformer manufactured by Bidder/ its sub-vendor should have been successfully short circuit tested.

3. Solar Inverter

(a) The Bidder/its Sub-vendor should have designed, manufactured and supplied grid connected solar Inverters of cumulative capacity of 40 MW or above, out of which at least one such supply order for a single plant should be of 10 MW or above capacity. The reference plant in which 10 MW or above capacity solar Inverters (consisting of one or more) were supplied, must have been in successful operation for atleast six (6) months prior to the following reference date:

Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.

And

(b) The Bidder/sub-vendor should have in-house solar Inverters routine testing facility as per relevant standard of solar Inverter.

And

(c) The offered solar Inverter model or any of its product family Inverter model or similar Inverter topology model must have been in successful operation for atleast six (6) months the reference date mentioned above. The Inverter product family model or similar Inverter topology model power rating should not be less than 50% of the offered Inverter model rating. The similar Inverter topology model must have identical power circuit configuration and same maximum DC input voltage rating as compared with the offered Inverter model. The Inverter product family model or similar Inverter topology model shall be further technically assessed to establish the similarity with the offered Inverter model and same shall be subjected to END CUSTOMER acceptance.

Note: - (i) The individual Inverter capacity of one (1) MW or above (for central Inverter) and 40kW or above (for string Inverter) shall only be considered for capacity determination.
(ii) In case the inverter manufacturer is not meeting the requirement as mentioned in Clause 5.0 (a) & (c) above, they can utilize the credentials of its principal/ holding or subsidiary company/ associate/ collaborator (a solar inverter manufacturer) through technology tie-up for meeting the criteria as stipulated in clauses 5.0(a) & (c).

HT Power cables (3.3kV or above but below 33kV)

4.The Bidder/ Sub Vendor should have manufactured and supplied following cables, prior to the following reference date:

Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.

(a) At least 100kms of XLPE insulated power cables of 1.9/3.3 kV or higher voltage grade, executed in one or more limited to maximum of three orders.
(b) At least one (1) km of flame-retardant low smoke cables of any voltage level.
(c) The plant for which cable have been supplied should have completed at least six months of successful operation prior to the date the reference date mentioned above.

HT Power cables (33kV)

5. The Bidder/ Sub Vendor should have manufactured and supplied following cables, prior to the following reference date: *Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.*

(a) At least 20kms of XLPE insulated power cables of 19/33 kV or higher voltage grade, executed in one or more limited to maximum of three orders.

(b) At least one (1) km of flame retardant low smoke cables of any voltage level.
(c) The plant for which cable have been supplied should have completed at least six months of successful operation prior to the reference date mentioned above.

6. DC Solar cables

The Bidder/ Sub Vendor should have manufactured and supplied following cables, prior to the following reference date:

Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.

(a) At least 150 kms of XLPO insulated DC Solar cables of 0.63/1.1 kV or higher voltage grade of minimum 4 sq mm size executed in one or more limited to maximum of three orders.
(b) The plant for which cable have been supplied should have completed at least six months of successful operation prior to the reference date mentioned above.
Note: In case the DC solar cable manufacturer is not meeting the requirement as mentioned in Clause 8.0 (a) and/or 8.0(b) above, they can utilize the credentials of its principal/ holding or subsidiary company/ associate/ collaborator (a solar DC cable manufacturer) through technology tie-up for meeting these criteria as stipulated in clauses 9.0(a) and (b) above.

Cable Laying Agency

8. The bidder/ Subcontractor should have executed cabling works in which it has installed Power cables of 1.1 kV or higher-grade cables along with associated accessories for an industrial installation which should have been in successful operation for a period of at least two (2) years prior to the following reference date.The total quantity of Power cables (HT cables, LT cables, DC cables etc.) laid should be 100 kms or more in maximum two contracts/works.

Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.

9. Robotic Dry-Cleaning System

The Bidder/its Sub-vendor should have designed, manufactured, supplied, erected/supervised erection, and commissioned/supervised commissioned Robotic DryCleaning System for at least two (2) Nos. of projects of min. 100 MWp capacity each worldwide, OR at least one (1) No. of project of min 50MWp capacity in India.

The reference plant in which 100 MWp / 50MWp respectively or above capacity is executed, must have been in successful operation for at least one (1) year prior to the following reference date:

Date of submission of proveness documents to END CUSTOMER or (LOA date + 6 months), whichever is earlier.

The bidder/ its sub-vendor may use the credentials of its Parent/ Group/ Holding company for meeting the requirement

ANNEXURE-IC-A

PACKAGE NAME: ---------- BIDDING
DOCUMENT NO. ----------
Undertaking from Main Contractor
(On letter head signed by a duly authorized person along with company/firm's seal on behalf of the Main Contractor)

Date:

To

NTPC Renewable Energy Limited, Engineering Deptt/ EIC (as applicable)

Subject: Authentication of veracity of documents submitted by M/.....in support of meeting the p r o v e n e s s requirements mentioned in technical specifications. Name of Item/work for which proveness documents are submitted: ……

Dear Sir,

We …….. (Main contractor name) hereby propose M/s. …….. having Registered office at…… as sub vendor for the aforementioned item/work in referred tender of NTPC Renewable Energy Ltd.

The tender condition stipulates that the main contractor shall duly verify, certify for its authenticity & correctness, and submit the credential documents of sub vendor pertaining to proveness criteria.
In this regard, it is hereby confirmed that we have examined the following documents, which are also attached with this letter. The same has been verified from the Original Documents and/ or Client for authenticity and correctness.

We hereby confirm that the following documents are found to be genuine and authentic.

1. Doc ref. no. …….. dated .....(name of Documents)
2. Doc ref. no. …….. dated .....(name of Documents)
3. ……

All the aforesaid documents have been signed by us as a certificate of authenticity.

Thanking you,
……
(Name and details)
(Company Seal)

** Strike off, whichever is not applicable.*

2. BRIEF SCOPE OF WORK

The scope includes the following:

1. Design, engineering, manufacturing, supply, packing and forwarding, transportation, unloading storage, installation, testing and commissioning of Solar Photovoltaic plant excluding Supply of Solar PV modules (PV Modules shall be supplied by End User and Tracker Modules shall be supplied by BHEL as Free Issue item).
2. Receipt, unloading at site, storage, installation, testing and commissioning of Solar PV Modules and Tracker
3. Site - Grading & Clearing of Vegetation (if required), Topographical survey (Optional),Geotechnical Investigation (Optional).
4. Construction of foundation & erection of Module Mounting Structure (MMS) with Tracker based Technology for SPV panels, including fixing of PV Modules on Tracker and PV Modules interconnection.
5. Arranging power supply and water supply for construction purposes.
6. Construction of Pre-Engineered type Inverter room (if applicable) with Power conditioning unit associated LT and HT switchgear. In case of String Inverter, Construction of Pre-Engineered type HT Switchgear room.
7. All associated electrical and civil works required for interfacing with grid (i.e. transformers, panels, protection system, cables, metering at 33kV level, facilitation for grid compliance study as per regulation etc. etc.), evacuation of power to 33kV Switchgear of 33/400kV GIS Substation provided by Owner through 33kV cable and placement of SCADA, PPC panel and associated equipment at identified location in Main Control Room of 33/400kV GIS Substation.
8. Laying and termination of HT Cables (including supply) as per specification.
9. Design, supply, and installation of Module cleaning system (Robotic Dry-Cleaning Method) including supply and installation of all accessories. Robotic Dry-Cleaning System would be acceptable where in 25 Years Design life need to be certified by the Bidder for C4 (Non-costal) Category Corrosion Environment for Above Ground Structures and C5-M (Coastal) for below Ground Structures
10. Construction of internal roads, pathways, construction of Drainage system as per General Layout and Topography, any internal / temporary fencing (except project boundary fencing), security cabin etc.
11. Construction of main road along the periphery of all four blocks (Approx length: 19.26 KM)as per the section detailed in the tender drawings.
12. SCADA system for remote monitoring and control of Inverters with all hardware & software and complete set of Weather Monitoring Station including cloud cover as per specification SCADA, and associated equipment shall be installed at identified location in Main Control Room of owner's 33/400kV GIS Substation
13. Design, supply, installation, testing and commissioning of Dynamic reactive power compensation equipment and all equipment for power quality control like Harmonic filter, flicker compensators etc. to comply with the requirements at POI to 400KV Khavda ISTS Substation as per grid connectivity regulations and as per the "Report of the Working Group in respect of Data Submission Procedure and Verification of Compliance to CEA Regulations on Technical Standards for Connectivity to the Grid by RE Generators July 2022". Grid Compliance study shall be done by owner as per the inputs from the bidder.
14. Comprehensive Operation & maintenance of SPV Plant along with electrical equipment, consumables and spare parts for a period of Three years from the date of commissioning of full Project capacity.
15. Supply of Mandatory spares excluding tracker.

Revision details:	Prepared Indrajeet Kumar Digitally signed by Indrajeet Kumar DN: cn=Indrajeet Kumar, o=Bharat Heavy Electrical Limited, ou=BHEL SBD Banglore, email=indrajeetkumar@bhel.in, c=IN Date: 2025.03.19 11:41:09 +05'30' INDRAJEET KUMAR	Approved PUNAM MISHRA-SDGM Digitally signed by PUNAM MISHRA-SDGM DN: cn=PUNAM MISHRA-SDGM, o=BHEL, ou=SBD, email=punammishra@bhel.in, c=IN Date: 2025.03.19 12:51:11 +05'30' PUNAM MISHRA	Date: 19.03.2025