

SECTION - I

NOTICE INVITING TENDERS (NIT)

NTPC Limited
(A Government of India Enterprise)
NOTICE INVITING TENDERS (NIT)

(Domestic Competitive Bidding)

Name of Package	Supply, Erection, Testing, Commissioning and O&M of 60 KWp Roof-Top Grid Connected Solar PV at Various Buildings at NTPC Bongaigaon
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- 1.0 NTPC invites on-line bids on **Single Stage Two Envelope Basis** from eligible Bidders for the aforesaid package.
- 2.0 A complete set of Bidding Documents including detailed Scope of Work and Terms & Conditions may be downloaded free of cost by any interested Bidder from <https://eprocurentpc.nic.in>.
NOTE:
No hard copy Bidding Documents shall be issued. Corrigendum (if any) shall be available on our e-tender website <https://eprocurentpc.nic.in> only
- 3.0 Online payment of Tender fee on GPNIC portal through SBI Gateway has already been implemented (Refer help document attached for Online payment on GPNIC portal). Any bid not accompanied by an acceptable Bid Security and Tender Fee AS PER RELEVANT PROVISIONS OF SPECIAL CONDITIONS OF CONTRACT (SCC) shall be rejected by the employer as being non-responsive and shall not be opened.
- 4.0 Notwithstanding anything stated above, the Employer reserves the right to assess the capabilities and capacity of the Bidder/ his collaborators / associates/ subsidiaries/ group companies to perform the contract, should the circumstances warrant such assessment in the overall interest of the Employer. The physical assessment shall include but not be limited to the assessment of office/facilities/banker's/reference workers by Employer. A negative determination of such assessment of capacity and capabilities may result in rejection of the bid
- 5.0 NTPC reserves the right to reject any or all bids or cancel / withdraw the Invitation for Bids/NIT without assigning any reason whatsoever and in such case no bidder / intending bidder shall have any claim arising out of such action.
- 6.0 Downloading of bid documents by any Bidder or submission of offer thereof shall not construe that such bidder is considered to be qualified. Bids shall be submitted online and opened at the address given below in the presence of Bidder's representatives who choose to attend the bid opening.
- 7.0 NTPC reserves right to amend any bid/tender conditions through appropriate CORRIGENDUMS published in the portal AT ANY TIME. NTPC also reserves the right to extend/change the bidding schedule through publishing necessary CORRIGENDUMS in the portal if the situation demand so AT ANY TIME. The corrigendum as decided by NTPC and deemed fit would be published in the portal as per provisions therein. This para prevails over the relevant provisions in Instruction to bidders (ITB) section II of the bid document. The corrigendum/amendment as published/posted in the portal will be binding on Bidders and it will be assumed that the information contained therein will have been taken into account by the Bidder in its bid. Bidders are advised to regularly check the tender regarding posting of Amendments/Corrigendums , if any.
- 8.0 Transfer of Bidding Documents purchased by one intending Bidder to another is not permissible.
- 9.0 MSE and Make In India Benefits: The bidders may apprise themselves of the relevant provisions of bidding documents in this regard before submission of their bids

10.0 UDIN: It is mandatory to mention UDIN (Unique Document Identification Number) by the bidders while submitting audited financial statements, other CA certificates etc. w.e.f. date as mentioned in ICAI gazette notification dt. 02.08.2019.

18.0 Address for Communication

AGM (C&M/CS)-I/c, NTPC LIMITED, SSC (ER-II), TSTPS, KANIHA, DEEPSHIKHA, ANGUL, ODISHA, 759 147. DIAL: 06760-247244, e-mail- sssahu@ntpc.co.in	DY. MANAGER (C&M/CS), NTPC LIMITED, SSC (ER-II), TSTPS, KANIHA, DEEPSHIKHA, ANGUL, ODISHA, 759 147. DIAL: 06760-247262, e-mail- ssundarnayak@ntpc.co.in
Registered Office: NTPC Limited, NTPC Bhawan, SCOPE Complex, 7, Institutional Area, Lodhi Road, New Delhi – 110003 Corporate Identification Number: L40101DL1975GOI007966. Corp. Website: www.ntpc.co.in Tendering Website: https://eprocurementpc.nic.in	

NTPC LIMITED
(A Government of India Enterprise)



SECTION – V

Scope of Work

SSC ER-II, NTPC Ltd.

Installation of grid connected Solar PV Project on Rooftop of Various buildings of NTPC Bongaigaon Township.

Total Estimated Solar PV Capacity: 60KWp

SCOPE OF WORK & TERMS CONDITIONS

The Solar Photo Voltaic (PV) installation on Rooftop of various buildings of the Township shall be carried out preferably on shadow free area in such a way that the generation is maximized on each building suitable for installation of Solar PV power plants.

List of buildings identified by NTPC for installation of rooftop Solar PV power are as follow and the bidder shall consider utilizing all the rooftops for installing solar PV project.

1. Hospital Building.
2. Administrative Building.
3. SBI Building.

However, the bidder is advised to visit the plant to ascertain site conditions prior to bidding in order to avoid any uncertainty or ambiguity later.

NTPC reserves the right to add/reduce one or more building(s) and change rooftop area available on any of the building(s) during the course of execution of the contract depending on the prevailing circumstances. The resulting variation in the actual Solar PV plant capacity with respect to estimated capacity as above and consequent variation in contract prices shall be in proportion with the quoted unit rate basis (cost quoted per KWp).

Bidder to do assessment for water connection from our existing service during site survey. Bidder also to do assessment of expansion joints and door opening etc. for capacity finalization. Material handling / lifting equipment shall be arranged by agency and there should be no any dependency on NTPC.

Standard Quality plan has been uploaded in the system. The successful bidder after award the contract shall have to submit their own quality plan based on standard quality plan of NTPC against equipment & items covered in Serial No-15 for our approval.

1. SCOPE OF WORK

1.1 Determination of optimal grid connected roof-top Solar PV power plants capacity on all the Buildings listed above.

1.2 Complete design, engineering, manufacture, inspection, supply, transportation, storage, insurance, civil work, erection, testing and commissioning of the grid connected rooftop Solar PV plants including all auxiliaries. The scope of work shall also include O&M for 5 years.

1.3 All materials, manpower, scaffolding materials, machinery tools and tackles, transportation & loading/unloading, packaging and unpacking, safe storage etc. shall be provided by Contractor. Scope shall cover all type of transportation of materials inside the working site and man power etc.

required to execute and complete the work. The contractor shall also provide all required safety PPEs to all its workers that would be mobilized for installation purpose and has to adhere to all safety regulations strictly. Moreover, the area at which the work is executed shall be cleaned properly and cleared off all debris to the satisfaction of NTPC representative post completion of erection activities.

1.4 Suitable arrangement for metering of output from each solar PV feeder.

1.5 Termination of the solar PV feeder at owners# LT switchgear panels or lighting panels.

1.6 As per connectivity regulation for renewable energy plants notified by CEA, measurement of Total Harmonics Distortion, DC injection and Flicker at point of connection is to be done annually. Contractor shall arrange, on its own, one set of necessary measuring instruments on returnable basis and carry out these tests at least once during the O&M period.

1.7 Providing a suitable Solar PV module cleaning & water washing system. Bidder shall also provide for water connection from the nearest service water line with necessary pumping arrangement and provide adequate number of water taps with isolating valves depending on the roof area.

1.8 The successful bidder on award of contract shall warrant the faithful performance of all equipment of the plant as per Clause 13 (A) of technical specifications.

1.9 Take suitable action to prevent modules getting defaced due painting and other ongoing activities at being undertaken at height.

1.10 Facilitating statutory approvals related to the installation including CEIG clearance, if applicable, and associated incidental/logistical expenses.

1.11 Facilitate in the submission of application for getting Approval and clearances required from Government departments, wherever applicable

1.12 Bidder to dispose of the packing material, surplus items, unused materials, waste etc. generated during EPC at location(s) identified by NTPC.

2. TECHNICAL SPECIFICATIONS

Solar PV system shall consist of following equipment/components.

I. Solar PV crystalline modules

II. Module Mounting Structures (MMS) and Civil Structures

III. String Monitoring Units

IV. PCU / String Inverter

V. Transformers (it is required only if there is substantial and frequent difference in voltage between output of inverter and the bus voltage of the feeder to which the solar PV system shall be connected)

VI. Cables

VII. Suitable metering arrangement 0.5 class MFM/meter or meter as per specification

VIII. Earthing and lightning protections

IX. Conduits, pipes and accessories

X. Suitable ACB's/MCCB or LBS and ACDB's.

3. SOLAR PHOTO-VOLTAIC (PV) MODULES

3.1 The Solar PV modules must conform to the latest edition of IEC 61215 / IS14286 for Crystalline Silicon Terrestrial PV Modules design qualification and type approval.

3.2 The capacity of each of the solar module shall not be less than 200 Wp and no negative tolerance from quoted power rating on solar module shall be allowed.

3.3 Module should have visual distinct identification mark based on the measured output in a band of maximum 3 Wp. The glass used for making module shall be minimum 3.2mm thickness. Each string shall have identical Wp rating Solar PV modules. In addition, the modules must conform to IEC 61730 Part-1 - requirements for construction & Part 2 - requirements for testing for safety qualification or Equivalent IS. Module should also comply to IEC-61701 for salt mist testing. In addition, the modules must conform to IEC 61730 Part-1 - requirements for construction & Part 2 - requirements for testing for safety qualification or Equivalent IS. Module should also comply to IEC-61701 for salt mist testing.

The offered Solar PV module design series as per type certificate must have been in successful operation for at least six months as on date of submission of Techno Commercial Bid.

Each PV module used must have a Radio Frequency Identification Tag (RFID) capable of withstanding harsh environmental conditions carrying technical details of the Module.

4. MODULE MOUNTING STRUCTURE (MMS)

4.1 Solar PV Module shall be suitably inclined to receive optimum insolation at the site. To accommodate more capacity and maximizing generation output, the angle inclination may be optimized to achieve the best performance requirements. However, the overall layout of solar PV modules shall provide for minimum 1200 mm wide clear pathway along the roof parapet for facilitating easy access and movement of maintenance personnel with equipment. Inter row gap should be at least 1000 mm.

4.2 Module Mounting Structures must be suitable to mount the Solar PV Modules on the roof top, at an angle of tilt with the horizontal in accordance with the latitude of the place of installation preferably with a Fixed Tilt angle.

4.3 The Module Mounting Structure support and fixation arrangement shall be designed in such a way that it does not damage or deteriorate the strength, durability and performance of the roof including water proofing carried out on the roof.

4.4 Type of mounting arrangement shall be selected depending on the load bearing capacity of roof and applicable wind load at the roof level. For wind data, refer Wind Data as given in Annexure A.

4.5 Roof of Main power house and Permanent Store Building consist of Metal Deck sheet with 40mm concrete cover over it.

4.6 The bidder therefore, shall provide module mounting arrangement with self-standing holding-down blocks/skids to be positively located right above the purlins of these buildings. Indicative support arrangement detail of solar panels on roofs with metal deck shuttering & on roofs with RCC slab are attached as Annexure-B. In case offered support structure is of MS type then, the frames and the complete leg assemblies of the array structures shall be Hot Dip Galvanized. Thickness of galvanization will be IS-4759 or relevant standard. In case offered support structure is of Aluminium Alloy necessary protection shall be provided anodization. The grade of anodic coating shall be C25 as per IS: 1868.

4.7 Module Mounting Structures shall be designed to withstand the extreme weather conditions in the area. The risk coefficient factor (K1) shall be taken as 1.05. The terrain factor (K2) and topography factor (K3) shall be as per IS 875.

4.8 All fasteners including Nut & Bolts shall be of Stainless steel - SS 304. Other hardware will have to be adequately protected against all climatic condition.

4.9 The complete MMS, suitable supporting base/foundation and connections shall be designed & submitted for NTPC approval before start of manufacture / fabrication of MMS.

4.10 The construction methodology shall also be submitted for NTPC approval before start of works.

5. CABLES AND CONNECTIONS

5.1 The cables used in the system should be ISI marked PVC or XLPE insulated FRLS Copper/aluminium conductor. Cables of various sizes as per load requirement for connecting all the modules / arrays to Junction Boxes and from Junction Boxes to DC distribution box and from DC distribution box to inverter. Cables shall be armoured type if laid in switchyard area or directly buried.

5.2 Cables for use at the DC-side of PV system shall meet the requirements of TUV standard 2 PFG 1190/5.18 or EN-50618 or other equivalent standard.

5.3 Suitable rigid conduits shall be provided for cables connecting Solar PV array with Inverter. All cable entry to and from Inverter must be able to prevent access of rodents, termites and other insects into the Inverter.

5.4 The permissible voltage drop from the Solar PV Module to the Inverter shall not be more than 2% of peak power voltage of source.

5.5 All electronic connections of inverter should be properly terminated, soldered and/or sealed from outdoor and indoor elements. Relevant codes and operating manuals must be followed.

5.6 Extensive wiring and terminations (connection points) for all Solar PV components is needed along with electrical connection to grid injection point.

5.7 Bidder can use existing cable tray and trestle subject to NTPC approval, wherever cable tray is not available or suitable for placement of additional cables, the bidder shall provide cable trays.

6. PCU / STRING INVERTOR

PCU/ String Inverter of minimum 90% of Solar Field name plate capacity should be provided to convert DC power produced by Solar PV modules to AC power. The PCU / String Inverter should be grid interactive and the output should be compatible with the grid frequency. Typical technical features of the PCU / String Inverter shall be as follows:

6.1 PCU / String Inverter shall be transformer less design with minimum euro efficiency of 97%.

6.2 PCU / String Inverter shall have MPPT features and may be selected in a way to keep string voltage within MPPT range under all temperature conditions from 10 deg to 50deg ambient.

6.3 The String Inverter shall be suitable for parallel operation with Total Harmonics Distortion of current less than 4% at 50% load.

6.4 PCU / String shall be capable of operation at at design ambient temperature of at least 50 deg C without any deration.

6.5 PCU / String Inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown.

6.6 Built-in meter at PCU / String Inverter and data logger to monitor plant performance through external computer shall be provided. Customized solar monitoring solutions available with Inverter manufacturer shall be preferred.

6.7 The PCU / String Inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC61683 and IEC 60068.

6.8 The PCU / String Inverters should comply with IEC-61727 or IEC-62116 or equivalent standard for grid connectivity.

6.9 The protection class of electronics components of string inverter should be IP 65(for outdoor) and balance of system of string inverter shall be IP 54 (indoor). For other components i.e. ACDB, DCDB etc, the specification in the relevant clauses of the document shall prevail. The PCU / String Inverters should be tested from NABL/BIS accredited testing-calibration laboratories or MNRE approved test centre or international testing laboratories such as TUV, Intertek, UL etc.

6.10 For all buildings, only String Inverters may be specified. All PCU / String Inverters should be 3-phase inverters

6.11 In case combiner box is used, the enclosure shall be Flammability Fire Retardant, Halogen free and UV resistant with IP 55 class or better.

6.12 PCU / String Inverter shall have provision of taking auxiliary power supply from its own output terminals.

7. TRANSFORMER

Isolation/Step up/step-down Transformer shall be converter duty suitable for solar inverter application., the transformer shall be dry type of suitable voltage rating, 50 Hz shall be provided along with all protections, switchgears, circuit breakers, cables etc. and required civil work. The rating and vector group shall be as per inverter manufacturer recommendation.

If the output of the inverter matches to the switchgear voltage and suitable for directly connection to grid without galvanic isolation, the requirement of transformer may still be included for all buildings.

Dry Type Transformer shall be constructed in accordance to IS:2026, IS:11171, Indian Electricity Act 2003, BEE Guideline & CEA notifications and equivalent to any other transformer rating and all related technical parameters including tap changer (if applicable) shall be as per system requirement/SLD and relevant standards. It shall be suitable for continuous indoor/outdoor duty application. Transformer shall be complete & functional in all respect. The other important construction particulars shall be as below.

7.1 The transformers shall be housed in a metal protective housing, having a degree of protection of IP-42. The enclosure shall be provided with suitable hardware (as required).

7.2 The conductors shall be of electrolytic grade copper free from scales & burrs.

7.3 Dry Type Transformer windings shall be of class F insulation or better.

7.4 The core shall be constructed from non-ageing, cold rolled, grain oriented silicon steel laminations.

7.5 The maximum losses for dry type transformer shall not be more than the values specified in latest energy conservation building code (ECBC) of BEE.

7.6 The fittings/accessories including protection/monitoring device generally required for satisfactory operation of the transformer, are to be provided.

7.7 Suitable rain shed arrangement shall be provided to keep transformer under that arrangement

7.8 Painting shall be as per employer's requirement (will be finalized during detailed engineering)

7.9 Type and routine test shall be conducted as per IS11171

7.10 In case the bidder/contractor has conducted such specified type test(s) within last ten years as on the date of bid opening, he may submit the type test reports to the owner for waiver of conductance of such type test(s). These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and test(s) should have been either conducted at an independent laboratory or should have been witnessed by client.

In case the bidder is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in case the type test report(s) are not found to be meeting the specification requirements the bidder shall conduct all such tests under this contract at no additional cost to the employer and submit the test reports.

8. INTEGRATION OF SOLAR PV POWER WITH GRID

8.1 In case of grid failure or low/ high voltage, Solar PV system shall be disconnected from the grid. Once the grid is energized / normalized, the Solar PV system shall again be automatically re-synchronized and load requirement would be met to the extent of availability of power. The power evacuation voltage shall be at 415 V, 3-phase 4-wire system or 230V, single phase 2-wire system depending on availability of LP/spare feeder.

8.2 For all buildings contractor have to provide 0.5 class MFM with CT and circuit breaker.

All switchboard frames and load bearing members shall be fabricated using suitable mild steel structural sections or pressed and shaped cold-rolled sheet steel of thickness 2.0mm. Frames shall be enclosed in cold-rolled sheet steel of thickness 1.6 mm. Doors and covers shall also be of cold rolled sheet steel of thickness 1.6 mm. Stiffeners shall be provided wherever necessary. The gland plate thickness shall be 3.0 mm for hot / cold-rolled sheet steel and 4.0 mm for non-magnetic material.

8.3 NTPC shall provide spare solar feeder at the nearest available MCC or LP and the termination at the solar feeder lies in the scope of the bidder. The location of the solar feeder shall be decided during the detailed engineering. Refer Annexure-C for evacuation details.

8.4 The system should be provided with all necessary protections like Earthing, Lightning & Surge and Grid Islanding in accordance with the latest codes & standards and best industry practices.

8.5 Metallic frame of all electrical equipment shall be earthed by two separate and distinct connections to earthing system, each of 100% capacity

8.6 Protection shall comply as per CEA's Technical standard for connectivity of the distributed generation resources, Regulation 2013.

9. DATA MONITORING:

Bidder has to aggregate Data as specified in Clause 9.1 from each Inverter to a Single PC .

The plant monitoring shall have following,

9.1 Measurement of Solar PV parameters at PCU / String Inverter level: PCU / String Inverter shall have provision of measuring and displaying actual value of AC & DC Voltage, AC & DC Current, and AC Power & Energy Generated by the Solar PV system. These PCU /String Inverter parameters shall have provision of data logging through Mod Bus (RS-485) protocol.

9.2 Solar Irradiance: An integrating Pyranometer (Class II or better) shall be provided, with the sensor mounted on a Horizontal plane at a shadow free suitable location near solar arrays.

10. CLEANING & WATER WASHING ARRANGEMENT FOR SOLAR PV PANELS

An appropriate Solar PV Module cleaning & water washing system complete GI pipes, valves, hose pipes, wipers, mops etc. shall be provided for regular cleaning and water washing of the rooftop Solar PV modules. Minimum two sets of Microfibre based cleaning tool is to be provided for each rooftop location. The system shall be specifically designed to take care of the harsh & dusty environment of thermal power plants. Drainage for this system shall be arranged by the bidder. Clean water shall be made available at the nearest point from where bidder to make necessary pumping & treatment, if required, and piping arrangements for water washing of PV modules.

11. BALANCE OF SYSTEM (BOS) ITEMS/ COMPONENTS

The BOS items / components of the Solar PV plant(s)/ system(s) deployed must conform to the latest edition of IEC/equivalent BIS Standards.

12. COMMISSIONING OF ROOFTOP SOLAR PV

Individual solar rooftop location is deemed to be commissioned after the completion of all the facilities (COF) pertaining to scope of work of that rooftop location.

13. WARRANTY OF ROOFTOP SOLAR PV

(A) Solar PV modules used in plant(s)/ system(s) must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25years.

All the mechanical mounting system and structures along with PCU / String Inverters of the Solar PV plant must be warranted against any manufacturing, design and installation defects for a minimum period of one year from COF of plant.

14. PERFORMANCE GUARANTEE TEST FOR ROOFTOP SOLAR PV

The performance Guarantee (PG) Test shall be carried out after successful commissioning of all solar rooftop locations. PG Test shall be carried out on any rooftop location by measuring Performance Ratio (PR) and comparing to the Guaranteed PR. The test shall be repeated for each location having inverter of having different make or type of control. In case there are more than one rooftop having similar inverter, the test rooftop shall be decided based on mutual consent. The mathematical formula for calculating PR is given below:

$$PR (\%) = AC \text{ Yield}(KWh) \times 100 / \text{Installed Capacity}(kWp) \times \text{Global Inclined Insolation}(kWh/m^2)$$

For measuring Global Inclined Insolation (GII), another pyranometer shall be installed at the plane of the module as per specification 9.2.

Bidder also to install Single Quadrant type of 0.2s accuracy energy meter. This meter shall have a provision of storing 15 min Net MWhr in a register for minimum 40 days and Cumulative Net MWH at every midnight for 10 days. Both the additional supplied items i.e. pyranometer and energy meter shall be returnable basis and free of cost. The PR measured on site will be compared with the Guaranteed PR as indicated below:

Month	Guaranteed PR
January	81.97%
February	80.64%
March	80.01%
April	79.03%
May	78.30%
June	77.74%
July	77.76%
August	77.38%
September	77.77%
October	78.55%
November	80.07%
December	81.30%
Average(PR Yearly)	79.20%

Yearly solar Insolation of the site=1673 kWhr/ m² (as per Meteonorm)
Measuring instruments to record on site data will include a pair of pyranometers (horizontal and inclined with sensitivity of 7#V/(W/m²), temperature sensor, signal converter.

The contractor will be responsible to conduct the PG test only after achieving the physical completion and synchronization of the plant and complying the relevant requirements from utility.

The PG test will be conducted for durations in which irradiance level is greater than 750W/m² and the test will continue until a total horizontal radiation of 5 kWh/m² has been achieved. The data will be recorded at 15 minute intervals for validating the PR values guaranteed by the contractor against the value mentioned in the above for that month. In case of destruction due to any component failure, entire test will be repeated.

The PR values shall be computed based on actual energy exported to the grid at the output of isolation/step-up/step-down transformer as per SLD as shown in Annexure-C.

If failed to achieve the guaranteed performance levels, the contractor will at its own cost rectify all the defects identified during the test and take necessary steps/efforts to pass the PR test within the stipulated time span. Subsequent to rectification the PR will be restarted.

During PG test, if there is a grid outage, those time slots will not be considered

If the values are again below the guaranteed performance levels, contractor will be liable to pay Liquidated Damages (LD) to NTPC. The LD against failure of PG test shall be limited to 15% of the contract value.

15. QUALITY REQUIREMENTS FOR ROOFTOP SOLAR PV

This is indicative List of tests/ checks. The manufacturer is to furnish a detailed quality Plan indicating the practice & procedure along-with the relevant supporting documents.

1. PCU

- A) Incoming Quality Checks on bought out items
- B) In-process quality checks,
- C) Routine tests as per following on the assembled PCU:
 - 1) Test to demonstrate automatic / manual synchronization and connection to utility service
 - 2) Functional check on all protections
 - 3) Check on accuracy of all parameters measured by PCU
 - 4) Test to demonstrate operation of start-up, stable operation of the PCU, disconnection and shutdown controls and response to other control signals
- D) Following sample tests on one sample of PCU:
 - 1. Heat run test including measurement of phase currents, efficiencies, harmonic content and power factor at four points preferably 25, 50, 75 and 100% of the rated nominal power.

2. SPV module

SPV modules quality plan should include the following:

- A) Incoming Quality Checks on bought out items (listed in third party test reports of relevant standard)
- B) In-process quality checks
- C) Sample tests as per following:
 - 1) SPV modules to be checked visually for following defects: (sampling as per General Inspection Level II and AQL 1.5% as per IS 2500 Part 1)
 - a) Scratches on the frame and/or glass
 - b) Excessive or uneven glue marks on glass or frame
 - c) Inconsistent cell colors
 - d) Completeness of module in all respects
 - 2) Performance of SPV module at STC (sampling as per General Inspection Level II and AQL 1.5% as per IS 2500 Part 1)
 - 3) IR-HV-IR test (sampling as per Special Inspection Level S-3 and AQL 1.5% as per IS 2500 Part 1)
 - 4) Robustness of terminations on 1 sample per offered lot
 - 5) Mechanical load test on 1 sample per offered lot

Notes: 1) This is an indicative List of test/checks. The manufacturer is to furnish a detailed. Quality Plan indicating his practice and procedure along with relevant supporting documents during QP finalization for all item.

2) All major Bought out Items will be subject to NTPC approval.

ANNEXURE-A

Wind Data

CRITERIA FOR WIND RESISTANT DESIGN OF STRUCTURES AND EQUIPMENT

All structures shall be designed for wind forces in accordance with IS:875 (Part-3) and as specified in this document. Site specific information is given below.

Along wind forces shall generally be computed by the Peak (i.e. 3 second gust) Wind Speed method as defined in the standard. Along wind forces on slender and wind sensitive structures and structural elements shall also

be computed, for dynamic effects, using the Gust Factor or Gust Effectiveness Factor Method as defined in the standard. The structures shall be designed for the higher of the forces obtained from Gust Factor method and the Peak Wind Speed method.

Analysis for dynamic effects of wind must be undertaken for any structure which has a height to minimum lateral dimension ratio greater than "5" and/or if the fundamental frequency of the structure is less than 1 Hz. Susceptibility of structures to across-wind forces, galloping, flutter, ovalling etc. should be examined and designed/detailed accordingly following the recommendations of IS:875(Part-3) and other relevant Indian standards.

It should be estimated if size and relative position of other structures are likely to enhance the wind loading on the structure under consideration. Enhancement factor, if necessary, shall suitably be estimated and applied to the wind loading to account for the interference effects.

No reduction in wind forces shall be considered due to parapet walls.

An increase in allowable stresses of structural material should not be considered during design analysis.

The Module Mounting structure and its foundation system design shall include at least the MMS Structural system design (structural members, bolts, base plates, anchors dead loads required etc.), check for uplifting of MMS structure, toppling of structure during wind loads and safety of supporting slab for downward reaction passing on the structure.

Damping in Structures

The damping factor (as a percentage of critical damping) to be adopted shall not be more than as indicated below for:

- a) Welded steel structures : 1.0%
- b) Bolted steel structures : 2.0%
- c) Reinforced concrete structures :1.6%
- d) Steel stacks :As per IS:6533&CICIND Model Code whichever is more critical

SITE SPECIFIC DESIGN PARAMETERS

The various design parameters, as defined in IS: 875 (Part-3), to be adopted for the project site shall be as follows:

- a) The basic wind speed "Vb" at ten metres above the mean ground level : As per IS-875 (part-3)
- b) The risk coefficient "K1": 1.05
- c) Category of terrain: Category-II

OTHER TERMS AND CONDITIONS

LD (Liquidated Damage):

1) Commissioning: LD @ Rs 39.2 per day per KWp shall be levied for any delay from the scheduled date of commissioning, subject to maximum of 5% of total cost of plant.

2)PG TEST: The LD applicable against PG Test is detailed at point no. 14 (PERFORMANCE GUARANTEE TEST FOR ROOFTOP SOLAR PV)

NTPC LIMITED
(A Government of India Enterprise)



SECTION – IV

***SPECIAL CONDITIONS OF CONTRACT
(SCC)***

***SSC (ER-II), NTPC KANIHA,
ANGUL, ODISHA, 759147***

SPECIAL CONDITIONS OF CONTRACT (SCC)

NOTE:

The following Special Conditions of Contract (SCC), Section-IV, shall supplement / amend the General Conditions of Contract (GCC) Section-III, Instructions to Bidders (ITB) Section II, Technical Specifications and Bid Drawings Section-V and Forms and Procedures Section VII. Wherever there is a conflict, the provisions in SCC shall prevail over those in the other sections of tender documents as mentioned above. The corresponding clause number of the GCC/ITB is indicated in parentheses.

IMPORTANT INSTRUCTION:

THIS IS A NO DEVIATION TENDER, WHICH MEANS- NO DEVIATION, WHATSOEVER, IS PERMITTED BY THE EMPLOYER TO ANY PROVISIONS OF BIDDING DOCUMENTS. ACCEPTANCE TO THE GTE IN GEPNIC WOULD CONFIRM THAT THE BIDDER HAS ACCEPTED ALL THE TERMS AND CONDITIONS OF THE BID DOCUMENT.

SI	CLAUSE REFERENCE (IF ANY)	SPECIAL CONDITIONS	
1	Currency (ITB Sub-Clause 12.2)	Indian Rupees	
2	Bid Validity (ITB Sub-Clause 13.1)	180 Days	
3	TYPE OF BIDDING	Single Stage Two Envelope Bidding	
4	REVERSE AUCTION	NOT APPLICABLE	
5	TENDER FEE	NOT APPLICABLE	
		NOT APPLICABLE	
6	BID SECURITY DECLARATION (ITB sub-clause 14)	In lieu of Bid Security/EMD, Bidders shall submit acceptance to the "Bid Security Declaration" under GTE on GePNIC. The content of the declaration is attached below.	
7	DOCUMENTS TO BE SUBMITTED FOR THIS TENDER: (REF. ITB SUB-CLAUSE 11.3.1 + BID FORMS OF FORMS & PROCEDURES)	<p>a) Documents to be Uploaded Online in GePNIC "Fee/Pre-Qual/Technical/Finance" Folder:</p> <p>1. PRICE BID (Bidders may note SCC Clause No. 54 while quoting)</p> <p>NOTE:</p> <p>1. BIDS, WHICH DO NOT MEET THE MINIMUM LOCAL CONTENT AS MENTIONED AT CLAUSE NO. 29 OF SCC FOR THE SUBJECT TENDER, SHALL BE CONSIDERED NON-RESPONSIVE AND SHALL BE OUT RIGHTLY REJECTED. (THIS IS TO BE ACCEPTED UNDER GTE)</p> <p>2. ANY BID NOT ACCOMPANIED BY AN ACCEPTABLE EMD AND DULY FILLED UP ATTACHMENT-3 IN ACCORDANCE WITH THE PROVISIONS OF THE BID DOCUMENTS, BEFORE THE BID SUBMISSION DATE AND TIME, SHALL BE REJECTED BY THE EMPLOYER AS BEING NON-RESPONSIVE AND SHALL BE REJECTED WITHOUT BEING OPENED.</p> <p>3. NO OTHER DOCUMENTS, MENTIONED ELSEWHERE IN TENDER DOCUMENTS, ARE REQUIRED TO BE SUBMITTED OFFLINE/ONLINE.</p>	
8	NAME AND ADDRESS OF EMPLOYER:	WHERE THE CONTRACT SHALL BE EXECUTED: NTPC LTD., BONGAIGAON THERMAL POWER PROJECT, SALAKATI, KOKRAJHAR, ASSAM, 783369.	FROM WHERE THE BID HAS BEEN INVITED: NTPC LTD., SSC (ER-II), TSTPS, DEEPSIKHA, KANIHA, ANGUL, ODISHA, 759147. Ph.-06760247262

		NTPC Registered Office Address: NTPC Bhawan, Core 7, Scope Complex, Institutional Area, Lodhi Road, New Delhi, India, 110003.
9	Pre-Bid Conference (ITB sub-clause 7.0)	Not Applicable.
10	Engineer-in-Charge (GCC Clause 8) (GCC Sub-Clause 8.1)	For the purpose of the sub-clause entitled Engineer-In-Charge/ Officer-In-Charge under clause "Settlement of Disputes" appearing in the GCC, the AGM (EED), NTPC Bongaigaon or his nominated representative shall act as Engineer-In-Charge/ Officer-In-Charge.
11	Settlement of Disputes (GCC Clause 8) (GCC Sub-Clause 8.3.3.3)	Court of Competent Civil jurisdiction at High Court, Cuttack, Odisha. (Place of Arbitration: The Arbitration shall be held at Delhi only. (As per GCC Sub-Clause 8.3.3.3)
12	Price Basis	The Contract price shall remain FIRM throughout the contract period and will NOT be subject to adjustment for price escalation during the performance of the Contract.
13	Time for Completion and LD for Delay (GCC Clause 25) (ITB Clause 15)	a. Time for Completion: 03 Months from Date of Start of Contract for supply, installation and commissioning of the system. b. Time for Completion (O&M period): 05 Years from the date of successful commissioning and completion of facilities. LD Clause shall be as per Section-V.
14	QUANTITY VARIATIONS (As per GCC Clause 45)	As per GCC.
15	Methodology of Execution & Equipment Mobilisation (GCC Clause 28, Sub-Clause 28.3)	As per Section-V of the tender documents.
16	Materials for the performance of the Contract (GCC Clause 30, Sub-Clause 30(b) (i))	As per Section-V of the tender documents.
17	Total value of owner issue material (GCC Clause 30) GCC Sub-Clause 30(b)(i)	As per Section-V of the tender documents.
18	Security Deposit /CPG (GCC Clause No. 19; Amended vide SCC Cl. 52)	Contract Performance Guarantee (CPG): a. The bidder shall submit a Contract Performance Guarantee (CPG) in the form of a Bank Guarantee amounting to Three (03)% of contract value on award of work with validity period upto 120 days beyond the scheduled defect liability period. b. In case of extension of the contract period for Supply, Installation & Commissioning portion of the contract, beyond 03 (three) months of the original completion period, the validity period of CPG shall be extended accordingly. The CPG shall be submitted within 15 days of issue of Purchase order (PO) along with the Purchase Order (PO) acceptance copy against contract performance for incorporation in the PO, failing which NTPC is at liberty to take action as per provision of the contract.
19	Power & Water Supply and boarding and lodging of employees/ labour / staff (GCC Clause 37.2.1)	As per Section-V of the tender documents.
20	Safety Terms & Safety Equipment	As per Section-V of the tender documents.
21	Defects Liability Period (GCC Clause 41)	Defect Liability Period shall be 05 (Five) Years after successful commissioning of total system or completion of O&M period whichever is later.

22	Employer's and Contractor's Risks and Insurance	Shall be as per GCC Clause 42 and its sub-clauses.	
23	Third Party Insurance Policy	As per GCC.	
24	Payment Schedule & Penalties (Details as per GCC Clause No. 20)	<p>1) Supply Component :- a) 70% of payment against supply of main equipment shall be made after receipt and acceptance of material at site. b) 15% on completion of installation and successful commissioning of the SPV system and its certification by EIC. c) 15% of payment against supply shall be made on successful completion of PG Test and issuance of Operational acceptance certificate by the Project Manager.</p> <p>2) E&C Component :- (a) 80% of the E&C cost component including civil works shall be paid on pro-rata basis on completion of installation of equipment and commissioning of same and on certification by the EIC for the quantum of work completed. b) 20% on successful completion of PG Test and issuance of Operational acceptance certificate by the Project Manager.</p> <p>3) O&M component :- The O&M/AMC charges shall be paid on pro-rata basis on certification of EIC.</p> <p>4) The payment against the line item "compliance to Safety Rules" shall be released as per Clause No. 20.7 of GCC which is inserted via Clause No. 36 of SCC.</p> <p>Contract Agreement:- The Contract Agreement will be signed between the authorized representatives of the Contractor and Engineer-in-Charge (EIC), on a non-Judicial Stamp Paper, within 15 days from the date of issuance of PO. Payment of bills shall only be processed after execution of Contract Agreement by both the parties.</p> <p>The stamp paper should be of appropriate value (as per the applicable Stamp Act of the State) and should be purchased from the State where the Project/ Station is located. Draft Contract agreement shall be mailed by the C&M dept. to the agency and EIC.</p>	
25	Integrity Pact (ITB Clause 30.0)	NOT APPLICABLE	
26	Address for Correspondence: Address at which the EMD/ Bid is to be submitted with name of contact person and alternate contact person.	DY. MANAGER (C&M/CS), NTPC LIMITED, SSC (ER-II), TSTPS, KANIHA, DEEPSHIKHA, ANGUL, ODISHA, 759 147. DIAL : 06760-247262 e-mail- ssundarnayak@ntpc.co.in	AGM (C&M/CS)-I/c, NTPC LIMITED, SSC (ER-II), TSTPS, KANIHA, DEEPSHIKHA, ANGUL, ODISHA, 759 147. DIAL : 06760-247244, e-mail- sssahu@ntpc.co.in
27	EVALUATION CRITERIA (Ref. Clause 23.0 and 24.0 of ITB)	THIS WILL BE AN ITEM RATE TENDER WITH OVERALL PACKAGE EVALUATION .	
28	Type of Contract (for the purpose of GST & MSE Benefit (Clause 31 of ITB))	<p>1. THIS IS A SERVICE / WORKS CONTRACT.</p> <p>2. MSE BENEFIT SHALL NOT BE APPLICABLE.</p>	
29	Preference to Make in India and granting of	1. THE MINIMUM LOCAL CONTENT SHALL BE: 50 %. THIS HAS TO BE ACCEPTED BY BIDDERS UNDER GTE ON GEPNIC PORTAL.	

	<p>purchase preference to local suppliers</p> <p>(Details at ITB Clause 32.0)</p>	<p>2. FOR THE PURPOSE OF GRANTING PURCHASE PREFERENCE, SPLITTING IS NOT POSSIBLE.</p>
30	Rule for TIE breaking	<p>In case there are more than 1 (one) L-1 bidders whose total quoted bid price is same, the following procedure shall be adopted to break the tie and decide the lowest evaluated bidder:</p> <p>“All the L-1 bidders shall be asked to give a “single over all % (percentage) of discount” over their quoted price in a sealed envelope on a suitable place, date and time to be intimated to them by NTPC.”</p>
31	Vitiation Clause	<p>During execution of the contract, if vitiation takes place in the contract, the successful bidder has to extend suitable rebate to maintain the L-1 position.</p>
32	<p>GST, Taxes, Duties, Levies etc. [As per GCC Clause no. 22 and ITB Clause 11.3.1 (i)]</p>	<p>1. Bidders must quote the rate of GST in the designated tab in Price Bid (BOQ) on the GePNIC portal. In case bidder has indicated (Zero) or left the GST field blank, GST shall be treated as inclusive in the quoted price.</p> <p>2. The rates/amount quoted in the Schedule of Quantities shall be inclusive of all other taxes, duties, levies, fees, royalty, etc.</p>
33	Replacement of Clause No. 11.4.10 of GCC on Safety	<p>The Existing Clause No. 11.4.10 on “Safety” in GCC is hereby deleted and replaced by the following:</p> <p>The Employer has formulated Safety Rules for Construction & Erection of Power Plants and is enclosed at Annexure-B to GCC. These Safety Rules lay down the safety requirements for safe execution of project activities, responsibilities of the Contractor, and all concerned involved in Construction and Erection. The Contractor, including his sub-contractors, while executing the Works, shall strictly comply with these Safety rules and statutory requirements (including amendments thereof), as applicable, in respect of safety of personnel, equipment and materials at site area under execution of the Contractor.</p> <p>In addition to other clauses specified in ‘NTPC Safety Rules for Construction and Erection of Power Plants’ [as enclosed with GCC/SCC], Contractor shall adhere to the following provisions for payment linked to Safety Compliances as specified in Payment Terms:</p> <p>i) Safety Personnel Contractor shall adhere to the requirements of Clause 2.3 (requirement of Safety personnel) of ‘NTPC Safety Rules for Construction and Erection of Power Plants’.</p> <p>ii) Personal Protective Equipment & Safety Equipment Contractor shall adhere to the requirements of Clause 4 (Personal Protective Equipment) of ‘NTPC Safety Rules for Construction and Erection of Power Plants’ and the provisions of the Bidding Documents with regards to number of Safety Equipment/PPEs to be provided by the Contractor.</p> <p>In case Contractor fails to comply with aforesaid requirement, EIC/Safety Officer shall issue a warning letter/Non-compliance Memo to the Contractor regarding the same advising him to take corrective action. EIC/NTPC Safety Officer shall maintain written record of all such incidents when Warning letter/Non-compliance Memo is issued to the Contractor for not meeting the requirements of Clause 4.0 (Personal Protective Equipment) and the provisions of the Bidding Documents.</p> <p>iii) Safety Induction and Training</p>

		<p>Contractor shall adhere to the requirements of imparting Safety training as per Clause 8.0 (Safety Induction and Training) of 'NTPC Safety Rules for Construction and Erection of Power Plants.</p> <p>Contractor shall maintain written record of Safety trainings imparted to its Employees/ workmen for purpose of aforesaid payment. These records shall be available for review of EIC/NTPC Safety Officer all the time.</p> <p>iv) Medical and First Aid Amenities Contractor shall adhere to the requirements of Clause 13 (Medical and First Aid Amenities) of 'NTPC Safety Rules for Construction and Erection of Power Plants.</p> <p>NTPC Safety Officer/EIC shall maintain written record of incidences when requisite Medical and first aid amenities as per Clause 13 of Safety Rules were not available for purpose of aforesaid payment.</p> <p>v) Compliance to Work Permit System Contractor shall adhere to the requirements of Clause 17 (Work Permit System) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.</p> <p>In case Contractor fails to obtain work permit or fails to comply to any requirements of aforesaid Work permit system, he will be issued a warning letter/Non-compliance Memo by EIC/Safety Officer of NTPC regarding the same advising him to take corrective action.</p> <p>NTPC Safety Officer / EIC shall maintain written record of all such incidents when Warning letter / Non-compliance Memo is issued to Contractor for not complying with the requirements of Work Permit System as per Clause 17 of Safety Rules for purpose of aforesaid payment.</p> <p>NOTE: "Safety Rules for Construction & Erection of Power Plants" is hereby inserted as Annexure-B to GCC. This shall be separately attached along with the tender documents.</p>
34	Modification of Clause No. 12.3 of ITB.	<p>The following Paragraph is inserted between the First and Second Para of Clause 12.3 of ITB:</p> <p>Bidders are advised to price their bids in such a manner that the component for 'Amount linked to Safety Aspects/ compliance to Safety Rules' should not be less than TWO (02)% of the total value of Contract.</p> <p>In case 'Amount linked to Safety Aspects / compliance to Safety Rules' is less than aforesaid minimum percentage specified of the total value for works portion of Contract, the amount by which it is lower shall be retained proportionately from the other components the Contract price while releasing payments of each RA bill. No interest shall be payable on the amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount. The amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount shall be payable in part or full based on safety compliance duly certified by EIC and Safety-in-charge on quarterly basis.</p>
35	Amount linked to Safety Aspects/ compliance to Safety Rules	<p>The payment against this line item "Amount linked to Safety Aspects/ compliance to Safety Rules" shall be released as per Clause No. 20.7 of GCC which is inserted via Clause No. 36 of SCC.</p>

36	Payment of Amount linked to Safety Aspects/ compliance to Safety Rules	<p>A new Clause No. 20.7 "Payment of Amount linked to Safety Aspects/ compliance to Safety Rules" as detailed below is hereby inserted to GCC:</p> <p>Payment of Amount linked to Safety Aspects/ compliance to Safety Rules</p> <p>I. The amount linked to Safety Aspects/ compliance to Safety Rules shall be paid in two parts, viz,</p> <p style="padding-left: 40px;">A) 10% amount (calculated as 0.1 Y of the service portion amount of RA bill) shall be linked to Fatal/Major Accidents, and</p> <p style="padding-left: 40px;">B) 90% amount (calculated as 0.9 Y of the service portion amount of RA bill) shall be linked to various Safety Aspects specified in Safety Rules of NTPC.</p> <p>NOTE: Amount linked to Safety Aspects/ Compliance to Safety Rules' specified in Price Schedule</p> $Y = \frac{\text{Total amount for works Portion of the Contract (Civil + Structural etc.)}}{X} \times 100$ <p>II. While raising each RA Bill, Contractor shall claim Amount linked to Safety Aspects/ Compliance to Safety Rules in such a manner that amount claimed is equal to Y% of the total works portion (Civil + Structural etc.) of RA Bill.</p> <p>III. This aforesaid amount at para (I) shall be withheld from first and second monthly RA bill of the respective quarter/three month period and shall be released in part or full based on safety compliance duly certified by EIC and Safety-in-charge on quarterly basis. The amount for the entire quarter (i.e. RA bills raised during a 3 month period) shall be paid to the Contractors at the end of that three months period along with 3rd/last RA Bill for the quarter/three months period upon complying the following conditions:</p> <p>A) Amount of RA Bill linked to Fatal/ Major Accidents (0.1Y i.e. 10% of amount as elaborated above at para G.I.A)</p> <p>Aforesaid amount (on quarterly basis) shall be payable to Contractor only in case, there is</p> <p style="padding-left: 20px;">i) No fatal injury or accident causing death in that three months period and</p> <p style="padding-left: 20px;">ii) No Major injury or accident causing 25% or more permanent disablement to workmen or employees in that three months period. Permanent disablement shall have the same meaning as indicated in The Workmen's Compensation Act' 1923.</p> <p>In case of any fatal injury or accident as elaborated above occurs during that three month period, the stipulated amount (0.1Y) subject to minimum of Rs 10 Lakh per fatality shall be forfeited and shall not be payable to the Contractor under the contract. In case, the amount to be deducted/forfeited exceeds the amount linked to Fatal/ Major Accidents, the same shall be recovered from remaining Amount (0.9Y) linked to Compliance of Safety Rules and/or any other payments immediately due to the Contractor under the Contract.</p> <p>In case of any Major injury or accident causing 25% or more permanent disablement to workmen or employees occurs during that three month period, Rs 4 lakh per Major injury shall be deducted from the amount (0.1Y) linked to Fatal/ Major Accidents and shall not be payable to the Contractor under the contract. In case, the amount to be deducted/forfeited exceeds the amount linked to Fatal/ Major Accidents, the same shall be recovered from remaining Amount</p>
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	<p>(0.9Y) linked to Compliance of Safety Rules and/or any other payments immediately due to the Contractor under the Contract.</p> <p>Further, in case, Contractor doesn't raise RA Bills in any three month period/quarter and if any fatal injury and/or major accident takes place in that period, EIC shall deduct the amount [Rs 10 Lakh per fatality and Rs 4 lakh per Major injury] pertaining to this particular quarter from his next RA bill/due payment. In case, the amount to be deducted/forfeited exceeds the amount linked to Safety, the same shall be recovered from any other payments immediately due to the Contractor under the Contract.</p> <p>The amount deducted/forfeited as mentioned above shall be in addition to the compensation payable to the workmen / employees under the relevant provisions of the Workmen's Compensation Act' 1923 and rules framed there under or any other applicable laws as applicable from time to time.</p> <p>B) Amount of RA Bill linked to Compliance of Safety Rules (0.9Y i.e. 90% of amount as elaborated above at para G.I.B)</p> <p>Aforesaid amount (on quarterly basis) shall be payable to Contractor in five equal parts under five heads as under:</p> <p><u>(i) Amount payable on deployment of required Safety Personnel</u></p> <p>One fifth of the amount specified in para.III.B (calculated as 0.18Y of Service portion amount of RA Bill), on quarterly basis, shall be paid upon certification by EIC in consultation with Safety dept. that required number of Safety personnel as per Clause 2.3 of 'NTPC Safety Rules for Construction and Erection of Power Plants' (as enclosed with GCC/SCC) have been deployed. The aforesaid amount linked to deployment of requisite safety personnel shall be paid as under:</p> <p>a) 50% of the amount referred at III.B.(i), for deployment of Safety Supervisors shall be paid on pro-rata basis depending upon the actual no. of Safety Supervisors deployed vis-à-vis actual requirement :</p> <p>Amount to be paid = $0.09Y \times \text{Works portion of RA bill amount} \times (a/b)$</p> <p>Where 'a' is actual no. of Safety supervisors deployed And 'b' is required no. of Safety supervisors as per Safety Rules.</p> <p>In case, actual no. of Safety supervisors deployed is more than requisite number (i.e. a/b is more than 1), the amount to be paid shall be restricted to 0.09Y.</p> <p>b) 50% of the amount referred at III.B.(i), for deployment of Safety Officers shall be paid on pro-rata basis depending upon the actual no. of Safety Officers deployed vis-à-vis actual requirement :</p> <p>Amount to be paid = $0.09Y \times \text{Works portion of RA bill amount} \times (a/b)$ Where 'a' is actual no. of Safety Officers deployed and 'b' is required no. of Safety Officers as per Safety Rules.</p> <p>In case, actual no. of Safety Officers deployed is more than requisite number (i.e. a/b is more than 1), the amount to be paid shall be restricted to 0.09Y.</p>
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	<p>c) In case aforesaid requisite no. of Safety personnel are not deployed by Contractor, amount not to be paid as calculated above for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(ii) <u>Amount payable on providing requisite Personal Protective Equipment & Safety Equipment</u></p> <p>One fifth of the amount specified in para III.B (calculated as 0.18Y of Service portion amount of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of Clause 4 (Personal Protective Equipment) of 'NTPC Safety Rules for Construction and Erection of Power Plants' and the provisions of the Bidding Documents with regards to number of Safety Equipment/PPEs to be provided by the Contractor.</p> <p>In case of non-compliance by Contractor, warning letter/Non-compliance shall be issued by EIC/Safety Officer of NTPC as per GCC. Further, if more than two such warning letters/Non Compliance Memos are issued in a quarter/three monthly period, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(iii) <u>Amount payable on providing requisite Safety Induction and Training</u></p> <p>One fifth of the amount specified in para.III.B (calculated as 0.18Y of Service portion amount of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of imparting Safety training ad per Clause 8.0 (Safety Induction and Training) of 'NTPC Safety Rules for Construction and Erection of Power Plants' to at least 90% of its employees/workmen (who have not been previously provided with requisite training) in a quarter/ three months period.</p> <p>In case Contractor fails in meeting the aforesaid requirement, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(iv) <u>Amount payable on providing requisite Medical and First Aid Amenities</u></p> <p>One fifth of the amount specified in para III.B (calculated as 0.18Y of Service portion amount of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of Clause 13 (Medical and First Aid Amenities) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.</p> <p>In case Contractor fails to provide Medical and first aid amenities as per requirement of aforesaid Clause 13 even on one incidence in any quarter/three month period, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(v) <u>Amount payable on compliance to Work Permit System</u></p>
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		<p>One fifth of the amount specified in para III.B (calculated as 0.18Y of Service portion amount of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of Clause 17 (Work Permit System) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.</p> <p>In case of non-compliance by Contractor, warning letter/Non-compliance shall be issued by EIC/Safety Officer of NTPC as per GCC. Further, if more than two such warning letters/Non Compliance Memos are issued in a quarter/three monthly period, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>NOTE: No interest shall be payable on the amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount. The amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount shall be payable in part or full based on safety compliance duly certified by EIC and Safety-in-charge on quarterly basis.</p>
37	ELECTRICAL LICENSE	<p>The contractor must have valid LT Electrical License issued from statutory authority. The Contractor shall submit a copy of the license along with bid.</p>
38	INELIGIBILITY FOR FUTURE TENDERS Ref. Clause No. 28 of ITB	<p>Clause No. 28 of ITB is hereby amended and shall read as below:</p> <p>28.1 If a bidder after opening of tenders where EMD is 'NIL/Not applicable' or exempted for bidders as per policy guidelines, or where a bidder has submitted "Bid Security declaration" in lieu of Bid Security/EMD, withdraws its offer within the validity period of the offer, then such bidder shall be treated as ineligible for participation in the future tenders issued from NTPC for a period of 6 months from the date of withdrawal of the bid.</p> <p>28.2 If a bidder after having been issued the Letter of Award/Purchase Order of a package where EMD is 'NIL/Not applicable' or exempted for bidder as per policy guidelines, or where a bidder has submitted "Bid Security declaration" in lieu of Bid Security/EMD, either does not accept the Notification of Award/Purchase Order or does not sign the Contract Agreement pursuant to ITB Clause titled 'Signing the Contract Agreement' or does not submit an acceptable Performance Security pursuant to ITB Clause titled 'Performance Security', and which result in tender being annulled then such bidder shall be treated ineligible for participation in re-tendering of this particular package and contractual action may be taken as per provisions of the Bidding documents. Further, such vendor shall also be dealt as per the provisions of the policy for Withholding and Banning of Business Dealings.</p>
39	GCC Clause 55 (New Clause)	<p>GCC Clause 55 inserted as below :</p> <p>Procedure for Contract Closing</p> <p>55.1 The closing of Contract shall be effected after completion of the defect liability period and return/refund of CPG/Security Deposit.</p> <p>55.2 The following thirteen (13) certificates, as per the proforma enclosed in Section VIII (Forms and Procedures), shall be issued by the 'concerned departments of NTPC/ 'Contractor', as applicable, and submitted to the concerned authority designated in NTPC for closing of Contracts:</p>

CERTIFICATE NO.	CERTIFICATE DESCRIPTION	RESPONSIBILITY	LIMITING DATES FOR ISSUANCE
CCP-01	Certificate of Final Amendment to the Contract	Corporate Contract Services	7 Months from Synchronization
CCP-02	Drawing Receipt Certificate	Corporate Engineering	2 Months from Synchronization
CCP-03	QA Documents Receipt Certificate	CQA&I	2 Months from Synchronization
CCP-04	O&M Manual Receipt Certificate	Corporate Engineering	4 Months from Synchronization
CCP-05	Scope Completion Certificate	Site Erection	8 Months from Synchronization
CCP-06	Liquidated Damages for Delay Certificate		
(a)	For cases where LD for delay is settled by Corporate Contracts	Corporate Contract Services	7 Months from Synchronization
(b)	For cases where LD for delay is settled by the Regions/ Site	Concerned Site/ Regional offices	7 Months from Synchronization
CCP-07	Shortfall in Equipment Performance Certificate	<ul style="list-style-type: none"> • Corporate OS : Site Performance Test- Cat-I • Regional OS: Site Performance Test- Cat-II • Site : Site Performance Test-Cat-III • CQA&I : Shop Test 	5 Months from Performance and Guarantee (PG) Tests
CCP-08	"Material Reconciliation" Certificate	Site Erection & Site Materials Mgmt.	6 Months from Synchronization
CCP-09	"Payment Reconciliation" Certificate: Indian Contractor	Site Finance	6 Months from Synchronization
CCP-09A	Reconciliation Certificate for Payments by Site : Foreign Contractor	Site Finance	6 Months from Synchronization

		CCP-09B	Reconciliation Certificate for Payments by Corporate Finance: Foreign Contractor	Corporate Finance (IF Deptt.)	6 Months from Synchronizati on
		CCP-09C	"Customs Reconciliation" Certificate : Foreign Contractor	Transportation and Customs Clearance (T&CC) office	6 Months from Synchronizati on
		CCP-10	Certificate regarding Labour Payments and Statutory Requirements to be furnished by Contractor.	Contractor	9 Months from Synchronizati on
		CCP-11	"No Demand Certificate" by Contractor	Contractor	6 Months from PG Tests
		CCP-12	Certificate for Completion of Warranty Period	Site Erection/ O&M*	14 Months from Trial Operation/ Completion of Facilities
		CCP-13	Certificate for Return of BGs/ Indemnity Bondsetc.	Site Finance/ Corporate Finance	All BGs except CPG: 5 Month from Trial Operation / Completion of Facilities CPG: 15 Months from Trial Operation/ Completion of Facilities
		<p>55.3 Both the Contractor and the Employer will make necessary efforts to complete the Contract Closing activities as per the timelines as mentioned at clause 55.2 above.</p> <p>It shall be the responsibility of the contractor to submit the drawings alongwith the reproducibles, QA documents, O&M Manuals, List of Spares, As Built drawings, deliverables, etc., as applicable, in a timely and sequential manner so that the contract closing activities are not delayed/impeded.</p> <p>The Employer shall also use its best endeavors to expedite all activities leading to successful closure of the contract. The Employer will review and approve the documents submitted by the Contractor in a timely and expeditious manner and the approvals shall not be unreasonably withheld.</p>			

40	PMJJBY and PMSBY	The agency shall ensure coverage of their workers under Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY) for entire work period. Cost shall be borne by the Bidder for the same. This forms the part of the statutory HR compliances.
41	Replacement of Clause No. 1.2 of ITB	Throughout these Bidding Documents, the term “Bid” and “Tender” and their derivatives (Bidder/Tenderer, Bidding/Tendering, Bidding Document/Tender Document, etc.); Bill of Quantity / Schedule of Quantity / Schedule of Quantities/ Bill of Quantities; Employer / NTPC; Security Deposit / Performance Security/ Performance Guarantee; Engineer-in-Charge / Engineer, appearing any where in the Bidding Documents shall have the same meaning and are synonymous to each other.
42	Replacement of Clause No. 11.1 (a) of ITB	Attachment 1: Bid Security Declaration Bid Security Declaration shall be submitted in accordance with ITB Clause 11.3.1(a).
43	Modification to Clause 11.3.1(a) of ITB	Attachment 1: Bid Security Declaration Bid Security Declaration shall be furnished in accordance with ITB Clause 14. <i>(To be accepted online under GTE)</i>
44	Replacement of Clause No. 13.2 of ITB	In exceptional circumstances, prior to the expiry of the original bid validity period, the Employer may request the Bidders to extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing. A Bidder agreeing to the request will not be permitted to modify his bid.
45	Replacement of Clause No. 14 of ITB	14.0 Bid Security Declaration 14.1 The Bidder shall furnish, as part of its Bid, acceptance to the GTE Condition named ‘Bid Security Declaration’ 14.2 The format of the Bid Security Declaration shall be in accordance with the form of bid security declaration included in the SCC.
46	Modification to Clause No. 17 (A) (I) (b) of ITB	This point stands deleted.
47	Addition of Clause No. 17 (A) (II) (f) of ITB	Acceptance to Bid Security Declaration
48	Replacement of Cl. 18.1 of ITB	Bids must be submitted online no later than the time and date stated in the Bid Data Sheet. Original Bid Security Declaration, Deed of Joint Undertaking / JV Agreement (as applicable) and Power of Attorney shall be submitted in physical form before stipulated bid submission time at the address specified in BDS. Employer shall not be liable for loss/non-receipt/late receipt of above documents in postal transit.
49	Replacement of Cl. 20.4 of ITB	Withdrawal, cancelling or varying any terms in regard thereof of a bid during the interval between the deadline for the submission of Bids and the expiration of the period of bid validity specified in ITB Clause 13.0 above shall result in bidder being ineligible for participation in the future tenders issued from NTPC for a period of 06 months from the date of withdrawal of the bid.
50	Replacement of Cl. 23.4 of ITB	23.4.1 If the rates/prices quoted by the successful bidder for certain items of the Bill of Quantities (wherever such rates/prices have been called for in the bids,) are found to be having a variation of +/-25% or above in relation to Employer’s estimate of the cost of work to be performed under the contract, then such items of works shall be identified as abnormally high rate (AHR) or abnormally low rate (ALR). 23.4.2 After evaluation of the rates/prices analysis which includes early cash flow analysis, Employer/NTPC may require the successful bidder to provide a suitable undertaking to execute the items of works including the ALR items and complete the entire work under the contract.

		Further, the Employer may invite the successful bidder for discussions/tieups to safeguard the interest of the Employer/NTPC and ensure that the Bidder executes the ALR items of works and completes the entire work under the contract.
51	Replacement of Cl. 29 of ITB	<p>ADHERENCE TO FRAUD PREVENTION POLICY</p> <p>The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to the Fraud Prevention Policy of EMPLOYER displayed on its tender website http://www.ntpctender.com and shall immediately apprise Employer about any fraud or suspected fraud as soon as it comes to their notice. A certificate to this effect shall be furnished by the bidder along with his bid, in relevant attachment to Bid Form as per format enclosed with the Bidding Document. If in terms of above policy it is established that the bidder/his representatives have committed any fraud while competing for this contract then the bid shall be rejected.</p>
52	Replacement of Clause No. 19.1.1 & 19.1.2 of GCC	<p>The Contractor shall within Forty Five (45) days of the Letter of Award or prior to release of 1st RA bill/Mobilization advance whichever is earlier, provide a Contract Performance Guarantee (CPG) towards faithful performance of the Contract for Three Percent (03%) of the Contract Price.</p> <p>The Contractor also has the option to furnish an Initial Contract Performance Guarantee (ICPG) equivalent to a minimum of 2% of the Contract Price within Forty Five (45) days of the Letter of Award or prior to release of 1st RA bill/Mobilization advance whichever is earlier. In case of such a Contractor, who furnishes Initial Contract Performance Guarantee, the Employer shall at the time of making any payment to him for the work done under the Contract deduct towards the Contract Performance Security an amount equivalent to 5% of the gross bill amount accepted for payment until the Contract Performance Security so deducted including the amount of Initial Contract Performance Security becomes equal to 3% of the Contract Price.</p>
53	BID SECURITY DECLARATION	<p>Acceptance to Bid Security Declaration under GTE on GePNIC shall mean that the bidder undertakes the following:-</p> <p>QUOTE</p> <p>"We confirm that we have read the provisions of the NIT no. and we hereby declare the following:</p> <p>1. We confirm that, in case we withdraw our offer within the validity period of the offer provided in the bidding documents or any extension thereof, then we shall be treated as ineligible for participation in the future tenders issued from NTPC for a period of 06 months from the date of withdrawal of the bid.</p> <p>2. In addition, we also confirm that in case after having been issued the Notification of Award/Purchase Order of a package, we either do not accept the Notification of Award/Purchase Order or do not sign the Contract or do not submit an acceptable Performance Security as per bidding documents provision, and which result in tender being annulled then we shall be treated ineligible for participation in retendering of this particular package and contractual action may be taken against us as per the provisions of the Bidding documents. Further, NTPC shall also be free to take further actions as per the provisions of the policy for Withholding and Banning of Business Dealings.</p> <p>UNQUOTE</p>
54	Minimum & Maximum Percentage of Supply Portion for Installation & Commissioning Portion and O&M Portion	<p>1. Bidders are advised to price their Bids in such a manner that the Installation & Commissioning component of the bid price should not be less than 15% and should not be more than 20% of the cumulative Supply component of the bid price".</p> <p>(a) In case Installation & Commissioning Price is less than 15% of the Supply Portion, the amount by which it is lower shall be retained proportionately from the Supply Portion component of Contract price while releasing payments due on receipt</p>

	<p>of equipment, and no interest shall be payable on the retained amount. The aforesaid retained amount shall be paid on pro-rata basis upon completion of installation of the respective equipment and its certification by the Project Manager.</p> <p>(b) In case the Installation Price is more than 20% of the Supply Portion, the amount by which it is higher shall be retained while releasing progressive payments due on installation of equipment, and no interest shall be payable on the retained amount. The aforesaid retained amount shall be paid along with payment due on completion of Trial Operation / Completion of Facilities.</p> <p>2. "Bidders are advised to price their Bids in such a manner that the O&M component of the bid price should not be less than 10% and should not be more than 15% of the cumulative Supply component of the bid price.</p> <p>(a) In case O&M Portion Price is less than 10% of the Supply Portion, the amount by which it is lower shall be retained proportionately from the Supply Portion component of Contract price while releasing payments due on receipt of equipment, and no interest shall be payable on the retained amount. The aforesaid retained amount shall be paid on pro-rata basis upon completion of installation of the respective equipment and its certification by the Project Manager.</p> <p>(b) In case the O&M Portion Price is more than 15% of the Supply Portion, the amount by which it is higher shall be retained while releasing progressive payments due on installation of equipment, and no interest shall be payable on the retained amount. The aforesaid retained amount shall be paid along with payment due on completion of Trial Operation / Completion of Facilities.</p>
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Annexure-B

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NTPC SAFETY RULES

FOR CONSTRUCTION AND ERECTION OF POWER PLANTS

INTRODUCTION:

NTPC Limited is a Maharatna organization taking lead in realizing the power dreams of the Nation with a vision “To be one of the World’s largest and best power utilities, Powering India’s growth”. Safety is one of the prime concerns of NTPC and it always strives towards accident free construction, erection, commissioning, operation and maintenance of its power projects. In this process, NTPC has already formulated Safety policy and guidelines for smooth execution of all its project activities.

In order to strengthen the existing Safety Rules for Construction and Erection and thereby curbing the chances of accidents in Construction & Erection works at various projects of NTPC, the existing safety rules have been revised for strict implementation. These Safety Rules lay down the safety requirements for safe execution of project activities, responsibilities of the contracting agencies, and all concerned involved in Construction and Erection.

A. RESPONSIBILITIES OF CONTRACTORS FOR IMPLEMENTATION OF SAFETY RULES:

The Safety Rules for Construction & Erection as outlined hereunder, while setting out a broad parameter of safety norms, are not exhaustive. The contractor and his agencies are advised to refer to the following statutory provisions as amended from time to time for details and strict compliance therewith.

FOR GREENFIELD PROJECTS:

- (a) Building and Other Construction Workers (regulation of employment and conditions of service) Act, 1996 (briefly referred to as BOCW Act),
- (b) Building and other construction workers (regulation of employment and conditions of service) Central Rules, 1998 (briefly referred to as BOCW Rules) as adopted by the various State Governments,

FOR EXPANSION, MODIFICATION, ALTERATION AND, OR CONSTRUCTION ACTIVITY WITHIN AN EXISTING PLANT OPERATING AS PER APPROVED SITE PLAN UNDER THE FACTORIES ACT;

- (a) Factories Act, 1948,
- (b) Factories Rules, as adopted by the various State Governments
- (c) BOCW Act
- (d) BOCW Rules

The contractor is also required to ensure compliance with all the relevant Acts/Rules in addition to above.

It shall be incumbent on the contractor to ensure that the requirements of safety, statutory or otherwise specified, are fully met. Thus the onus of implementation of the norms so prescribed shall squarely rest with the contractor concerned or, on his behalf, his sub-contractor or any other agency deployed by him, indemnifying NTPC from all the liabilities that may arise out of any failure to comply with the above mentioned Acts/Rules or any contravention thereof by the contractor or any other sub-agency on his behalf.

Safety cannot be ensured solely through Rules and Regulations or Codes. It is the responsibility of the Contracting Agency to ensure that basic safety principles are incorporated in the planning stage of their mobilization, execution, installation of machines, equipment, storage, etc., and initiate and maintain *safety programs*. It is desirable to have a planned programme and secure adequate cooperation of senior management, EICs, sub-contracting agencies, supervisory personnel and workers involved to ensure the implementation of the provisions of these Rules in true spirit so as to achieve the ultimate goal of *accident prevention*.

It shall also be the responsibility of the contracting agency to provide amenities and safety requirements on each construction job in order to reduce or to eliminate hazards of construction activities and also to provide necessary *first aid* facilities as well as Ambulance van (in case of major agencies) for prompt transportation of injured persons to a physician or hospital.

It is also mandated that the authorized representative of NTPC, namely, the Engineer-in-charge, may, at his convenience, exercise such superintendence, supervision and, or control as may be deemed necessary, but this shall not absolve the contractor of his basic responsibility for strict compliance with the norms, standards and, or legal provisions as applicable under the Factories Act/Rules and the Building and other construction (regulation of employment and conditions of service) Act/Rules.

Section wise checklist of provisions of BOCW Act/Rules is given hereunder for ready reference of the contractor. (This list has been prepared in chronological order with primary importance to Section of Act and secondary importance to Rules)

S - Refers relevant Sections in BOCWA

R - Refers relevant Rules in BOCWR

Sl. No.	ITEMS	RELEVANT SECTIONS / RULES IN BOCWA AND BOCWR AND RBOCWR
1	Registration of establishment	S – 7, R – 23 to 27
2.	Display of registration certification at workplace	R – 26 (5)
3.	Hours of work	S – 28 R – 234 to 237
4.	Register of overtime	S – 28; S – 29 R – 241(1) Form XXII
5.	Weekly rest and payment at rest	R – 235
6.	Night shift	R – 236
7.	Maintenance of workers registers and records	S – 30 R – 238
8.	Notice of commencement and completion	S – 46 R – 239
9.	Register of persons employed as building workers	R – 240
10.	Muster roll and wages register	R – 241(1) (a); Form XVI and XVII
11.	Payment of wages	R – 248
12.	Display of notice of wages regarding	R – 249
13.	Register of damage or loss	R – 241(1)(a); Form XIX, XX, XXI
14.	Issue of wages book	R – 241(2)(a); Form XXIII
15.	Service certificate for each workers	R – 241(2)(b); Form XXIV
16.	Display an abstract of BOCWA and BOCWR	R – 241(5)
17.	Annual return	R – 242; Form XXV
18.	Drinking water	S – 32
19.	Latrines and Urinals	S – 33 R - 243
20.	Accommodation	S – 34
21.	Creches	S – 35
22.	First-aid boxes	S – 36 R – 231 and Schedule III
23.	Canteens	S – 37 R – 244
24.	Food stuff and other items served in the canteens	R – 245
25.	Supply of tea and snacks in work place	R – 246
26.	Food charges on no loss no profit basis	R - 247
27.	Delhi BOCW welfare Board Rules	R – 250 to 296
28.	Safety committee	S – 38 R – 208

29.	Safety officer	S – 38 R – 209 and Schedule VII
30.	Reporting of accidents and dangerous occurrences	S – 39,R – 210
31.	Procedure for inquiry in to the causes of accidents	R – 211
32.	Responsibility of employer	S - 44 R – 5
33.	Responsibility of Architects, Project engineer and Designers	R – 6
34.	Responsibility of workmen	R – 8
35.	Responsibility for payment of wages and compensation	S – 45
36.	Penalties and Procedures	S – 47; S – 55
37.	Excessive noise, vibration etc.	R – 34
38.	Fire Protection	R – 35
39.	Emergency action plan	R – 36
40.	Fencing of motors	R – 37
41.	Lifting of carrying of excessive weight	R – 38
42.	Health, Safety and Environmental Policy	R – 39
43.	Dangerous and Harmful Environment	R – 40
44.	Overhead protection	R – 41
45.	Slipping, Tripping, Cutting, Drowning and Falling Hazards	R – 42
46.	Dust, Gases, Fumes, etc.	R – 43
47.	Corrosive substance	R – 49
48.	Eye Protection	R – 45
49.	Head Protection and other protection apparel	R – 46; R – 54
50.	Electrical Hazards	R – 47
51.	Vehicular traffic	R – 48
52.	Stability of structure	R – 49
53.	Illumination	R – 50; R – 124
54.	Stacking of materials	R – 51
55.	Disposal of debris	R – 52
56.	Numbering and marking of floors	R – 53
57.	Lifting appliances and gears	R – 55 to 81
58.	Runways and Ramps	R – 82 to 85
59.	Working on or adjacent to water	R – 86 & 87

60.	Transport and earthmoving equipment's	R – 88 to 95
61.	Concrete work	R – 96 to 107
62.	Demolition	R – 108 to 118
63.	Excavation and Tunneling works	R – 119 to 168
64.	Ventilation	R – 153
65.	Construction, repair and maintenance of step roof	R – 169 to 171
66.	Ladders and Step ladders	R – 172 to 174
67.	Catch platform and hoardings, chutes, safety belts and nets	R – 175 to 180
68.	Structural frame and formworks	R – 181 to 185
69.	Stacking and unstacking	R – 186 & 187
70.	Scaffold	R – 188 to 205
71.	Cofferdams and Caissons	R – 206 to 211
72.	Explosives	R – 212 & 213
73.	Piling	R – 214 to 222
74.	Medical Examination for building and other construction worker, Crane operator an Transport vehicle drivers	R – 81; R – 223(a)(iii) and Schedule
75.	Medical examination for occupational health hazards	R – 233(a)(iv)
76.	Charging of workers for Medical Examination	R – 223(b)
77.	Occupational health centres and Medical officers	R – 225 and Schedule X & XI
78.	Ambulance van & room	R – 226 & 227 and Schedule IV & V
79.	Stretchers	R – 228
80.	Occupational health service for building workers	R – 229
81.	Medical examination for occupational health hazards	R – 223(a)(iv)
82.	Emergency care services and emergency treatment	R – 232
83.	Panel of experts and agencies	Central Rule 250
84.	Power of inspectors	Central rule 251

B. RESPONSIBILITIES AND DUTIES OF WORKERS

- (a) It shall be the responsibility of the worker to comply with the requirements of safety as laid down for him and the group of workers to which he belongs and fully cooperate in the discharge of the responsibility that has been assigned to the contractor.
- (b) If he discovers any defects in the lifting appliance, lifting gear, lifting device or those concerning any transport equipment or other construction equipment or tools as well as the physical work conditions, he will report such defects promptly to his employer or NTPC Engineer or other person in authority;
- (c) No building worker shall, unless duly authorized or in case of absolute necessity, remove or interfere with any fencing, guards, gangways, gear, ladder, hatch covering, life saving appliances, lighting or other things whatsoever required and provided for safety and health. If any of the aforesaid things is removed, the persons engaged in the work shall restore such thing at the end of the period during which its removal was necessary;
- (d) Every worker shall use only means of access provided in accordance with the approved norms and no person shall authorize or order another to use such means of access or method other than those approved;
- (e) Workers shall use such means of access and egress for going to and exiting from the workplace as provided.

SECTION - I

SAFETY MANAGEMENT

1.0 SAFETY MANUAL AND SAFETY POLICY:

- 1.1** The Safety policy of the contracting agency should reflect the commitment of the concerned agency towards safety and health of the workers specified for the particular site.
- 1.2** The Contractor shall have Safety Plan detailing the safety norms evolved through Safety Policy and Job Safety Analysis (JSA) or Hazard Identification & Risk Assessment (HIRA) of all package activities and constitute a Safety management program. Contracts shall also ensure POWRA (point of work risk assessment) before start of any activity.
- 1.3** The safety management programme in the form of Safety Manual shall give details of provisions proposed by the agency w.r.t. Job Safety Analysis (JSA) or Hazard Identification and Risk Assessment (HIRA) to ensure safety of the employees and elimination of health hazards. The Safety Manual including safety policy duly signed by the head/senior executive of the agency shall be submitted to the concerned Engineer-Incharge(EIC), NTPC before start of their project activities at site.
- 1.4** Each contracting agency shall have facilities for conducting the above safety management programme, commensurate with magnitude of the work under contract.

2.0 APPOINTMENT OF SAFETY OFFICER/SAFETY SUPERVISOR:

- 2.1** Each contracting Agency shall provide a sufficient number of qualified, suitable and experienced persons to manage all safety related matter on Site relating to the works. Irrespective of manpower employed by the agency whether temporary, casual, probationer, regular or permanent or on contract, Agency shall deploy a qualified Safety Officer/executive, responsible for carrying out the safety management programme before start of the work.
- 2.2** The safety officer shall create an organization, commensurate with the project activities, consisting of other staff as required for suitable deployment.
- 2.3** The schedule of requirement of safety personnel is given below.

No. of Workers	No. of Safety Supervisors	No. of Safety Officers
Up to 100	1	1
101 to 250	2	1
251 to 500	4	1
501 to 1000	6	2
1000 to 2000	6+ One additional supervisor up to every additional 250 workers	3
2000-3000	10+ One additional supervisor up to every additional 250 workers	4
3000-4000	14+ One additional supervisor up to every additional 250 workers	5
Above 4000	18 + One additional supervisor up to every additional 250 workers	5 + one safety officer up to addition 1000 workers

2.4 The qualification and experience of the safety personnel should meet the following criteria.

- a) Safety Supervisor: (i) Possesses recognized degree in any branch of Engineering. OR
(ii) Diploma in any branch of Engineering with at least one year construction experience.
- b) Safety Officer/Safety Executive: Qualification as given under BOCW Act/rules and minimum experience of three years.

2.5 In case contractor fails to employ the required safety professionals, the department may at the cost and risk of the contractor deploy additional/required safety professionals. The cost incurred towards this shall be deducted from contractor's bill at following the rates or actual whichever is higher.

- 1. Safety Engineer Rs. 1500/day.
- 2. Safety Supervisor Rs. 1000/day.

3.0 MEETING FOR SAFETY AFTER AWARD OF THE CONTRACT:

Representatives of contracting agency along with safety Officer/executive shall meet the concerned EIC of the particular activity prior to start of construction activities for the purpose of discussing safety standards and requirements applicable to the work under contract. The person representing the agency should be a responsible person for all their site activities.

4.0 PERSONAL PROTECTIVE EQUIPMENT:

4.1 The contracting agency should ensure sufficient inventory of personal protective equipment (PPEs) prior to initial mobilization as specified in the Bidding Documents. After identifying the need of the required PPEs for various activities performed at the site, an additional inventory of approx. 20% of required PPEs should be maintain during the execution of the work. A PPE plan shall be prepared which gives fair idea regarding issue of PPEs to various personnel as per the following 'PPE Selection Matrix'.

4.2 Mandatory PPEs: Wearing of Safety Helmet, Safety Shoes and reflective jacket is mandatory for all work at site and it should be ensured that all employees and project visiting personnel shall invariably wear safety helmet, safety shoes & reflective jacket.

PPE Matrix (apart from mandatory PPEs, i.e., Safety Helmet & Safety Shoes)

Activity	Type of Protection						Remarks, if any
	Hand	Eye	Ear	Body	Respiratory	Others	
Gas Welding & Cutting	LG	WG	-	LA	*SCBA/ OLBA	-	* for confined space
Electric Arc Welding	LG	HMWS	-	LA	*SCBA/ OLBA	-	* for confined space