



Bid Number/बोली क्रमांक (बिड संख्या):  
GEM/2023/B/4163169  
Dated/दिनांक : 02-11-2023

### Bid Document/ बिड दस्तावेज़

| Bid Details/बिड विवरण  |  |
|--|--|
| Bid End Date/Time/बिड बंद होने की तारीख/समय  | 16-11-2023 16:00:00  |
| Bid Opening Date/Time/बिड खुलने की तारीख/समय   | 16-11-2023 16:30:00  |
| Bid Offer Validity (From End Date)/बिड पेशकश वैधता (बंद होने की तारीख से)  | 120 (Days)   |
| Ministry/State Name/मंत्रालय/राज्य का नाम  | Ministry Of Power  |
| Department Name/विभाग का नाम   | Na   |
| Organisation Name/संगठन का नाम   | Ntpc Limited   |
| Office Name/कार्यालय का नाम  | Cg   |
| Total Quantity/कुल मात्रा  | 1  |
| Item Category/मद केटेगरी   | Procurement of Diesel Electric Tower Car for OHE Maintenance at NTPC Lara (Q3)   |
| MSE Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से एमएसई छूट   | No   |
| Startup Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से स्टार्टअप छूट   | No   |
| Document required from seller/विक्रेता से मांगे गए दस्तावेज़   | Experience Criteria,Certificate (Requested in ATC),Additional Doc 1 (Requested in ATC),Additional Doc 2 (Requested in ATC),Additional Doc 3 (Requested in ATC),Additional Doc 4 (Requested in ATC),Compliance of BoQ specification and supporting document<br>*In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer |
| Bid to RA enabled/बिड से रिवर्स नीलामी सक्रिय किया   | No   |
| Type of Bid/बिड का प्रकार  | Two Packet Bid   |
| Time allowed for Technical Clarifications during technical evaluation/तकनीकी मूल्यांकन के दौरान तकनीकी स्पष्टीकरण हेतु अनुमत समय | 3 Days   |
| Inspection Required (By Empanelled Inspection Authority / Agencies pre-registered with GeM)                                      | No   |
| Evaluation Method/मूल्यांकन पद्धति   | Total value wise evaluation  |

**EMD Detail/ईएमडी विवरण**

|                             |         |
|-----------------------------|---------|
| Advisory Bank/एडवाइजरी बैंक | ICICI   |
| EMD Amount/ईएमडी राशि       | 1000000 |

**ePBG Detail/ईपीबीजी विवरण**

|  |       |
|--|-------|
| Advisory Bank/एडवाइजरी बैंक  | ICICI |
| ePBG Percentage(%) / ईपीबीजी प्रतिशत (%)                               | 10.00 |
| Duration of ePBG required (Months) / ईपीबीजी की अपेक्षित अवधि (महीने). | 39    |

(a). EMD EXEMPTION: The bidder seeking EMD exemption, must submit the valid supporting document for the relevant category as per GeM GTC with the bid. Under MSE category, only manufacturers for goods and Service Providers for Services are eligible for exemption from EMD. Traders are excluded from the purview of this Policy./जेम की शर्तों के अनुसार ईएमडी छूट के इच्छुक बिडर को संबंधित केटेगरी के लिए बिड के साथ वैध समर्थित दस्तावेज़ प्रस्तुत करने हैं। एमएसई केटेगरी के अंतर्गत केवल वस्तुओं के लिए विनिर्माता तथा सेवाओं के लिए सेवा प्रदाता ईएमडी से छूट के पात्र हैं। व्यापारियों को इस नीति के दायरे से बाहर रखा गया है।

(b). EMD & Performance security should be in favour of Beneficiary, wherever it is applicable./ईएमडी और संपादन जमानत राशि, जहां यह लागू होती है, लाभार्थी के पक्ष में होनी चाहिए।

**Beneficiary/लाभार्थी :**

GM(C&amp;M)

GM (C&M)-CPG-1/ AGM(C&M)-CPG-1 NTPC Limited, Western Region II Headquarters, Plot No-87, Sector-24, Atal Nagar, Naya Raipur, Raipur Chhatisgarh-492018  
(Durga Prasad Pradhan)**Splitting/विभाजन**

Bid splitting not applied/बोली विभाजन लागू नहीं किया गया.

**Reserved for Make In India products**

|                                     |     |
|-------------------------------------|-----|
| Reserved for Make In India products | Yes |
|-------------------------------------|-----|

**MSE Purchase Preference/एमएसई खरीद वरीयता**

|   |     |
|---|-----|
| MSE Purchase Preference/एमएसई खरीद वरीयता | Yes |
|---|-----|

1. Bid reserved for Make In India products: : Procurement under this bid is reserved for purchase from Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. However, eligible micro and small enterprises will be allowed to participate. The minimum local content to qualify as a class 1 local supplier is denoted in the bid document. All bidders must upload a certificate from the

OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which the bid is liable to be rejected. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020 . In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.

2. Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% (Selected by Buyer) of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 100%(selected by Buyer) percentage of total QUANTITY. The buyers are advised to refer the OM No.F.1/4/2021-PPD dated 18.05.2023 [OM No.1 4 2021 PPD dated 18.05.2023](#) for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017.

## **Procurement Of Diesel Electric Tower Car For OHE Maintenance At NTPC Lara ( 1 set )**

**(Minimum 60% Local Content required for qualifying as Class 1 Local Supplier)**

### **Technical Specifications/तकनीकी विशिष्टियाँ**

|  |                          |
|--|--------------------------|
| Buyer Specification Document/क्रेता विशिष्टि दस्तावेज़ | <a href="#">Download</a> |
|--|--------------------------|

### **Consignees/Reporting Officer/परेषिती/रिपोर्टिंग अधिकारी and/ तथा Quantity/मात्र**

| S.No./क्र. सं. | Consignee Reporting/Officer/ परेषिती/रिपोर्टिंग अधिकारी | Address/पता  | Quantity/मात्र | Delivery Days/डिलीवरी के दिन |
|----------------|---|--|----------------|------------------------------|
| 1              | Har Narayan Anuragi                                     | 496440, NTPC Lara, Village - Chhapora, Tehsil - Pussore, Distt - Raigarh (CG) - 496440 | 1              | 180                          |

### **Buyer Added Bid Specific Terms and Conditions/क्रेता द्वारा जोड़ी गई बिड की विशेष शर्तें**

#### **1. Scope of Supply**

Scope of supply (Bid price to include all cost components) : Only supply of Goods

#### **2. Certificates**

Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

### 3. Buyer Added Bid Specific ATC

Buyer uploaded ATC document [Click here to view the file.](#)

## Disclaimer/अस्वीकरण

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority in Buyer Organization, whereby Buyer organization is solely responsible for the impact of these clauses on the bidding process, its outcome, and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specifications and / or terms and conditions governing the bid. Any clause(s) incorporated by the Buyer regarding following shall be treated as null and void and would not be considered as part of bid:-

1. Definition of Class I and Class II suppliers in the bid not in line with the extant Order / Office Memorandum issued by DPIIT in this regard.
2. Seeking EMD submission from bidder(s), including via Additional Terms & Conditions, in contravention to exemption provided to such sellers under GeM GTC.
3. Publishing Custom / BOQ bids for items for which regular GeM categories are available without any Category item bunched with it.
4. Creating BoQ bid for single item.
5. Mentioning specific Brand or Make or Model or Manufacturer or Dealer name.
6. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.
7. Floating / creation of work contracts as Custom Bids in Services.
8. Seeking sample with bid or approval of samples during bid evaluation process.
9. Mandating foreign / international certifications even in case of existence of Indian Standards without specifying equivalent Indian Certification / standards.
10. Seeking experience from specific organization / department / institute only or from foreign / export experience.
11. Creating bid for items from irrelevant categories.
12. Incorporating any clause against the MSME policy and Preference to Make in India Policy.
13. Reference of conditions published on any external site or reference to external documents/clauses.
14. Asking for any Tender fee / Bid Participation fee / Auction fee in case of Bids / Forward Auction, as the case may be.

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller within 4 days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

[This Bid is also governed by the General Terms and Conditions/ यह बिड सामान्य शर्तों के अंतर्गत भी शासित है](#)

In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws./जेम की सामान्य शर्तों के खंड 26 के संदर्भ में भारत के साथ भूमि सीमा साझा करने वाले देश के बिडर से खरीद पर प्रतिबंध के संबंध में भारत के साथ भूमि सीमा साझा करने वाले देश का कोई भी बिडर इस निविदा में बिड देने के लिए तभी पात्र होगा जब वह बिड देने वाला सक्षम प्राधिकारी के पास पंजीकृत हो। बिड में भाग लेते समय बिडर को इसका अनुपालन करना होगा और कोई भी गलत घोषणा किए जाने व इसका अनुपालन न करने पर अनुबंध को तत्काल समाप्त करने और कानून के अनुसार आगे की कानूनी कार्रवाई का आधार होगा।

---Thank You/धन्यवाद---

**NTPC Limited**  
( A Government of India Enterprise )

**Tender Enquiry No.** 9900267098

**Bill of Materials**  
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**Delivery Address:**

Lara STPP  
VILLAGE - CHHAPORA,PO/PS - PUS  
RAIGARH  
Chhattisgarh  
496440  
India

| Item  | Material Code | Description                          | UoM* | Total Quantity | Delivery Date |
|-------|---------------|--------------------------------------|------|----------------|---------------|
| 00010 | M7400000016   | WAGON: INSP&MAINT OHE<br>CAR,8W DETC | NO   | 1.000          | As per Bid    |

( UOM Legends :- NO - Number )

Tender Enquiry No. 9900267098

**TECHNICAL DATA SHEET**  
-----**00010 - M7400000016****Specification**

WAGON

DESIGN : DIESEL ELECTRIC INSP &amp; MAINT OHE CAR

TYPE : 8 WHEELER DIESEL ELECTRIC UNDERSLUNG

ADDITIONAL INFORMATION : RDSO SPEC NO-TI/SPC/OHE/8WDETC/0092

**NTPC Limited**  
( A Government of India Enterprise )

**Tender Enquiry No.** 9900267098

**ITEM DATA SHEET**

| Material Code | Item Text   |
|---------------|---|
| M7400000016   | <p>SUPPLY OF DIESEL ELECTRIC TOWER CAR AS PER RDSO SPEC NO-TI/SPC/OHE/8WDETC/0092 WITH LATEST AMENDMENTS</p> <p>NOTE: (1)PRE DISPATCH INSPECTION (PDI) WILL BE DONE BY M/S RITES/RDSO/RAILWAY at AGENCY'S WORKS. THESE CERTIFICATES FROM RDSO/RAILWAYS/RITES SHALL BE CHECKED AND VERIFIED AT NTPC LARA SITE.</p> <p>(2)AGENCY WILL DEPUTE THEIR REPRESENTATIVE AT NTPC/LARA FOR COMMISSIONING OF THE DETC.</p> <p>(3)RDSO CHARGES FOR (A) DESIGN LOAN CHARGES (B) DRAWING APPROVAL CHARGES (C) INSPECTION CHARGES WILL BE IN VENDOR's ACCOUNT.</p> <p>(4) FREIGHT CHARGES INCLUDING TRANSIT INSURANCE AND ANY OTHER CHARGES REQUIRED FOR MANUFACTURING AND TRANSPORTAION OF DETC, WILL BE IN VENDOR's ACCOUNT.</p> <p>(5) CO-ORDINATION WITH THE RAILWAY AUTHORITIES SHALL BE IN THE VENDOR'S SCOPE.</p> |



**NTPC Limited**  
( A Government of India Enterprise )

**Tender Enquiry No. 9900267098**

**VENDORS LIST**

| S.No. | Collective No. /<br>RFQ No. | Vendor Details |
|-------|-----------------------------|----------------|
|-------|-----------------------------|----------------|

**NTPC Limited**  
( A Government of India Enterprise )

**Tender Enquiry No.** 9900267098

**List of Documents**  
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Please note that below documents are needed to be provided along with Invoice.

| <b>S.No.</b> | <b>Document Description</b> |
|--------------|-----------------------------|
|--------------|-----------------------------|

**Chapter - I****GENERAL CONDITIONS****1.1 Scope**

1.1.1 This specification covers the design, manufacture, and supply, testing & commissioning of self-propelled 8-Wheeler Inspection & Maintenance OHE car for operation on broad gauge (1676mm) electrified (25 kV a.c.) routes of NTPC MGR circuit and Indian Railways. The 8-Wheeler Inspection & Maintenance OHE car is a self-propelled 4-axle vehicle and is used for periodical inspection, patrolling and maintenance of traction overhead equipment (OHE). It shall also be used for attending to break down, restoration and damaged OHE etc. It is also required to erect small lengths of catenary and contact wire by way of repairs of damaged OHE. The 8-Wheeler Inspection & Maintenance OHE car uses the power generated by the Diesel Alternator set provided in the OHE car for propulsion and not the power from live OHE.

1.1.2 In case of difference between the specification and / or exhibited drawings, the tenderer shall get an immediate clarification from RDSO which shall be final authority for clarification.

**1.2 CLIMATIC CONDITIONS**

1.2.1 The power pack & electrics of the OHE car shall be in continuous operation under the following atmospheric and climatic conditions: -

|   |                               |   |
|---|-------------------------------|---|
| 1 | Atmospheric temperature       | Metallic surface temperature under Sun: 75° C max. and in shade: 55 °C max.<br><br>Minimum temperature: - 10°C (Also snow fall in certain areas during winter season).  |
| 2 | Humidity                      | 100% saturation during rainy season.  |
| 3 | Reference site conditions     | i) Ambient Temp. : 50° C<br>ii) Humidity: 100%<br>iii) Altitude: 1000m above mean sea level.  |
| 4 | Rain fall                     | (i) Ranging from 1750 mm to 6250 mm.<br>(ii) Number of rainy days/annum 120   |
| 5 | Atmosphere during hot weather | Extremely dusty and desert terrain in certain areas. The dust concentration in air may reach as high as of 1.6 mg/m <sup>3</sup> . In many iron ore and coalmine areas, the dust concentration is very high affecting the filter and air ventilation system.                                    |
| 6 | Coastal area                  | OHE car and its equipment's shall have to be designed to work in coastal areas also wherein weather is humid and salt laden atmosphere with maximum pH value of 8.5, sulphate of 7mg per liter, max. concentration of chlorine 6 mg per liter and maximum conductivity of 130 micro siemens/cm. |
| 7 | Vibration                     | The equipment, sub-system and their mounting  |

|   |            |  |
|---|------------|--|
|   |            | arrangement shall be designed to withstand satisfactorily the vibration and shocks encountered in service as specified in clause 1.2.2.<br><br>High level of 50 g vibration and shocks. Accelerations over 500 m/s <sup>2</sup> have been recorded at axle box levels for long periods during run. Vibrations during wheel slips are of even higher magnitude. |
| 8 | Wind speed | High wind speed in certain areas, with wind pressure reaching 200kg/m <sup>2</sup> .   |

1.2.2 The equipment's and their arrangement shall withstand satisfactorily, the vibration and shocks normally encountered in service which are as below:-

- (a) Maximum Vertical Acceleration                      3.0g
  - (b) Maximum Longitudinal Acceleration                5.0g
  - (c) Maximum Train Acceleration                         2.0g
- [Where 'g' is acceleration due to gravity]

1.2.3 The OHE car shall be able to negotiate water logged tracks at 10 kmph, with water level of 102 mm above the rail top, for which the Equipment shall be suitably designed.

1.2.4 The OHE car and its principal assemblies shall be designed and manufactured to give satisfactory performance in the tropical climate, having very dry & dusty regions in arid zones of the country, to humid coastal areas and extreme cold climate of the northern region..

### 1.3 Design Development:

1.3.1 The Qualified Bidder should have supplied DETC Tower Car to Railways/other reputed Industries as per RDSO Specification.

### 1.4 Approval of Drawings:

1.4.1 "Approval" to the drawing means the approval to the general adoptability of the design features. RDSO shall not be responsible for the correctness of dimensions on the drawings, materials used, strength or performance of the components. The contractor shall be wholly and completely responsible for all these variables. The contractor, when submitting proposals or designs for approval of the RDSO, shall draw attention to any deviation or departure from the specification involved in his proposals or drawings.

1.4.2 Drawing for approval shall be submitted in standard size (s) as per IS: 696 along with main calculation details in triplicate. List of drawings/calculations to be submitted to RDSO for approval before undertaking manufacture of prototype DETC are given in ANNEXURE-2.

Any other drawings of which manufacturer desires to obtain approval of RDSO shall also be submitted to RDSO.

### **1.5 Prints:**

- 1.5.1 One set of tracing, two sets of their prints & two DVD/Pen Drive of the RDSO approved drawings/ calculations shall be supplied by the successful contractor with tower wagon. The tracings shall be on RTF of durable quality. Drawings shall be made on Auto CAD. Two sets of tracing, two sets of prints and two copies of approved drawings & calculations along with 3 DVDs shall be supplied to RDSO.
- 1.5.2 Each set of tracings shall form a complete set of working drawings, the first sheet being the index and the following sheets being arranged properly to show the various assemblies, sub- assemblies and components of complete works in the following sequence: -
- (a) Diagram sheets show the overall dimensions of the equipment, weights, and the relation of overall dimensions to the space in the OHE car.
  - (b) Lists of all parts grouped into major assembly with details of numbers per set, weight, specification material and drawing reference against each item.
  - (c) General arrangement drawings of complete equipment sets. Diagram of lubrication points indicating type of lubricant. Sub-assembly arrangement, drawing in proper and logical sequence.
  - (d) Detailed drawings: - On detailed drawing sheets, each part shall be identified by an alphabetic letter and the list of all parts forming the sub-assembly shall be tabulated just above the title block on the same sheet giving details against each alphabetic letter.

### **1.6 Contractor's responsibility:**

- 1.6.1 The contractor shall be entirely responsible for the execution of the contract strictly in accordance with the terms of this specification and the conditions of contract, notwithstanding any approval which RDSO or the Inspecting officer may have given:
- (a) Of the detailed drawing prepared by the contractor.
  - (b) Of the sub-contractors for materials.
  - (c) Of other parts of the work involved by the contractor.
  - (d) Of the tests OHE carried out either by the contractor or by the RDSO or the Inspecting Officer.

### **1.7 Warrantee:**

Warranty shall be 30 months from date of supply or 24 months from date of successful commissioning of the item at NTPC Lara site whichever is earlier.

### **1.8 Exhibited Drawings and standard Specifications:**

- 1.8.1 "Exhibited Drawings" means the drawings which are exhibited or provided by RDSO for the guidance of the contractor.

- 1.8.2 The exhibited drawings, illustrative of a range of standardized dimensions and fittings, are listed in Annexure -1. The design of the OHE car must comply with the dimensions, and fittings included in the exhibited drawings as far as possible. Any deviation from there shall be clearly mentioned in the form of a table on the drawing.
- 1.8.3 The exhibited drawings are not guaranteed to be free from discrepancies. The contractor while preparing the engineering drawings shall ensure that these are free from discrepancies. He shall also incorporate all modifications desired by the RDSO, subsequently, without prejudice to the date of delivery or contracted price, except as provided for under the conditions of contract.
- 1.8.4 To improve upon the performance, modifications and corrections are made in the specification and drawings from time to time. The contractor must, therefore, satisfy himself that the drawings being used by him are of the latest version. In case of any doubt, he must get it clarified from RDSO.
- 1.8.5 The Contractor shall procure at his own expense all the drawings and specifications required for the manufacture of the OHE car.
- 1.8.6 Copies of drawings referred to in this specification and given in Annexure-1 may be obtained from RDSO/ICF on payment.
- 1.8.7 Indian Railways Standard (IRS) specifications and Schedules of Maximum Moving Dimensions may be obtained on payment from the Manager, Government of India Publications, Civil Lines, Delhi 110 006 (INDIA).
- 1.8.8 Indian Standard Specifications (ISS) are available from Bureau of Indian Standards, 9-Bahadur Shah Zafar Marg, Delhi 110 002.

## **1.9 Materials:**

- 1.9.1 Materials used in the construction of the OHE car shall comply with the relevant IRS specifications or Indian Standard Specifications. Where IRS or ISS do not exist for specific components, the contractor shall submit proposed material specification for approval of RDSO.

## **1.10 Service Engineering:**

- 1.10.1 The Contractor shall arrange for the supervision of commissioning of the OHE car immediately after their receipt at ultimate destination. He is also required to carry out joint checking of the receipt of components regarding short shipment or transit damages.
- 1.10.2 The contractor shall ensure commissioning of the OHE car within 30 days from the date of intimation by the consignee.
- 1.10.3 The performance of OHE Car shall be demonstrated by the contractor after its successful commissioning at the consignee's works.
- 1.10.4 The contractor shall provide and ensure servicing facilities in India

throughout the warranty period. After the warranty period is over, he shall, on call, must give service support for troubleshooting and for obtaining spare parts.

- 1.10.5 A well designed and informative electronic portal for lodging of complaints and action taken by supplier shall made operative before dispatch of first prototype vehicle.

### **1.11 Training:**

- 1.11.1 The Contractor shall arrange to provide training in operation & maintenance of the OHE car for two men for six days at their works and user's place respectively. The training material shall be supplied as per Annexure 8-D. The cost of training shall be included in the price of tower car. The charges for travel, boarding and lodging of trainees shall be borne by NTPC.

- 1.11.2 Technical experts of the manufacturer, during commissioning of OHE car at consignee's premises, shall also adequately train operators/ maintenance staff nominated by the consignee for minimum period of 6 days.

### **1.12 Service Manuals and Spare Parts Catalogues:**

- 1.12.1 Detailed Maintenance & Service Manuals including the manual for trouble shooting & operational requirement, spare parts catalogues for the driver and maintenance staff for the OHE car shall be prepared and three copies supplied free of charge, to the consignee.

- 1.12.2 Three copies per OHE cars of Spare Parts Catalogues & list of must change items with periodicity & sources of supply shall also must be supplied to the consignee.

- 1.12.3 In addition, three copies each of the Maintenance/Service and troubleshooting manual shall have to be supplied to NTPC.

### **1.13 Electric Arc Welding:**

- 1.13.1 Indian Railways Standard Code of Practice for Electrical Arc Welding shall be followed. If the contractor desires to follow any other code of practice, it shall first to be submitted for approval of RDSO.

- 1.13.2 Welding symbols shall be in accordance to IS:813. Drawings on which such symbols appear, are to bear a note on the bottom left-hand corner, "WELDING SYMBOLS AS PER IS:813".

- 1.13.3 **NTPC Initial Letters:** Where parts are required to be marked with NTPC initial letters, they shall be 'NTPC'

- 1.14 **Sublet Orders for Materials:** Any subletting of orders for materials/work shall have prior approval of RDSO.

### **1.15 Spare Parts:**

1.16.1 The tenderer shall be responsible to ensure subsequent availability of the spare parts for the normal life of the respective equipment.

**1.16 Tools:**

List of tools & special tools for maintenance and overhaul of OHE Cars shall be supplied as per Annexure-8-A, 8-B by the Tenderer in accordance with Clause 6.1 of this specification. The cost of tools shall be included in the price of tower car. The successful Tenderer shall submit the drawings and specification of tools required for the maintenance of the OHE Car.

**1.17 Testing Kit:**

1.17.1 The tenderer shall supply testing equipment with **each** tower car required for ensuring optimum performance and trouble-free service of the major equipments & accessories provided in the OHE car (e.g. Diesel Engine, Traction Alternator, Traction Motor and other Equipments with accessories). The testing Equipment shall be supplied as per annexure-8-C. The cost of testing equipment shall be included in the price of tower car.

1.17.2 The Tenderer shall also offer separately special jigs, tools and instruments, which shall essentially be required for maintenance of OHE Car body. Essential Equipments and facilities required for attending local damage to Stainless Steel structures, OHE Car interiors etc. in case of accidental damages should also be furnished.

1.17.3 The contractor shall demonstrate to NTPC, the satisfactory functioning of the tools, jigs & instruments supplied by him. The Specification of testing equipment's shall be provided by successful Tenderer.

**1.18 OHE Maintenance equipments :**

The tenderer shall supply the following maintenance equipment along with tower car. The cost of maintenance equipment shall be included in the price of tower car.

- a) The technical specification No. TI/SPC/OHE/TIPS/1031 with latest amendment for infra-red imaging system suitable for monitoring and measurement of hot spot temperature for different applications.
- b) One Hydraulic Jack of 5 t capacity,
- c) One tifter 3t, Two tifter 1.5 t, (As per RDSO's Specification No. TI/SPC/OHE/TOOLPL/0990).
- d) Three pull-lift 0.75 t, Two pull-lift 1.5 t , One pull-lift 3t (As per RDSO's Specification No. TI/SPC/OHE/TOOLPL/1990).

**1.19 Quality Assurance Plan**

1.19.1 The contractor should possess valid ISO-9001:2000 certificate for his work's address, covering the items for which he is participating in the contract. The contractor shall formulate Quality Assurance program (QAP) detailing the methodology proposed to be followed to ensure a quality product. QAP shall cover quality assurance procedures and procedures to be followed during all stages of design, manufacture, testing and commissioning of the equipment. The Contractor shall define the role of each functional group in the Organisation for



achieving the required quality of the product and submit a comprehensive document "Quality assurance manual" in accordance with IS 10201-1982 as the basic guideline. The preparation of necessary charts and proforma shall be to IS: 7200 (Part- III)-82.

- 1.19.2 The Tenderer whose bid is accepted, shall be required to submit a "Quality Assurance Manual" by giving details as to how the quality of specific product is proposed to be assured. Supply of the equipment shall commence only after "Quality Assurance Plan" has been approved by RDSO.

The above shall apply to the main contractor as well as sub-contractors.

**Chapter -II****DIMENSIONAL OPERATING AND OTHER REQUIREMENTS FOR OHE CAR**

2.0 The OHE Car shall dimensionally conform to the following:

|        |  |  |
|--------|--|--|
| (i)    | Track gauge  | 1676 mm  |
| (ii)   | Minimum radius of curve  | Normally 175 meters, sharper curves with radius less than 175 meter are also available at isolated location. Regarding minimum radius of curvature for slip points, turnouts or crossover roads, para 17 of chapter II of Schedule-I of IRSOD (BG) Revised 2004 shall be applicable which provides for minimum of 175 m radius curves in case of 1 in 8.5 scissors cross over. |
| (iii)  | Maximum super elevation  | 165 mm   |
| (iv)   | Maximum Super -elevation deficiency  | 100mm  |
| (v)    | Maximum wind pressure  | 200 kg/m <sup>2</sup>  |
| (vi)   | Maximum moving Dimensions  | Maximum moving dimensions shall conform to diagram 1D of Indian Railway Schedule of Dimension (SOD) 1676 mm gauge (BG) revised 2004 with the pantograph and platform in lock down condition. Infringements, if unavoidable and fully justified, may be considered, if within the limits shown in SOD 1676 mm gauge (BG) revised 2004.  |
| (vii)  | Maximum permissible wheel base length of the OHE car, over hang beyond bogie center, buffer height draw bar height | These shall conform to Indian railway, schedule of dimension 1676 mm gauge (BG) Revised 2004. Adequate clearance shall be allowed so that no component of the OHE car shall infringe a minimum of 102 mm above rail level with wheels in fully worn conditions, full deflection of springs and effect of dynamics.   |
| (viii) | Maximum Axle load  | 20.32 t  |
| (ix)   | (a) Maximum Speed when coupled to a train  | 110Km/h  |
|        | (b) Max operating speed under its own power  | 110 km/h   |
| (x)    | Brakes   | All wheels with clasp brakes.  |

| (xi)  | Service Braking            | Pneumatic  |                          |
|-------|----------------------------|--|--------------------------|
| (xii) | Performance capabilities:- | i) Pay load (excluding Power equipment and hydraulic platform)   | 12tonnes (Approximately) |
|       |                            | ii) Period of continuous running at 110 km/h on generally tangent track followed by frequent to and fro movement at walking pace for 1-1/2 h).   | 5-1/2h total (4h+1-1/2h) |
|       |                            | iii) Period of continuous running at 40 km/h up or down gradient of 1 in 60 to be followed by frequent to and fro movement up to 5 km/h for 1-1/2 h on same gradient with speed control.   | 5-1/2h total (4h+1-1/2h) |
|       |                            | iv) Performance in monsoon and squally conditions.   | Un- restricted           |
|       |                            | v) OHE Car shall be capable of running at a speed of 75kmph with 2-loaded flat wagons weighing 120t at tangent track.  |                          |
|       |                            | vi) The OHE Car shall be capable of running at a speed of 25 km/h on 1 in 33 up gradient.  |                          |
|       |                            | vii) The OHE car shall be capable of starting and hauling Two wagons weighing 60t each in gross load condition (Total 120 tonnes) on an up gradient of 1 in 33. Maximum operating speed of the OHE car for level and 1 in 33 up gradients shall be indicated with the offer. |                          |
|       |                            | viii) With the hydraulic platform in raised condition the OHE car shall run at a maximum speed of 10 km/h.   |                          |
|       |                            | ix) The emergency braking distance (EBD) for fully loaded (20.32x4=81.28 t) OHE car from maximum speed of 110km/h to zero shall not be more than 800m on flat section. The contractor shall also submit calculation for EBD on 1 in 33 down gradient.                        |                          |

- 2.1 The purchaser may at his option revise the layout so as to provide for an arrangement for front opening on one side to load and unload collapsible ladders from the trackside. Tenderer may offer alternative proposals with full details of the advantages of his system.
- 2.2 The OHE car shall be an 8-wheeler vehicle. The disposition of equipment storage space shall be such as to ensure equal axle loads. Design shall be such as to afford easy inspection and maintenance.

2.3 Provision shall be made for the following in the OHE Car:

**2.3.1 Driving Cabs:**

- i) Two driving cabs shall be provided, one at each end, with complete operating & driving control with dash boards to facilitate operation from either cab. Driver's seat shall be on the left side. Adequate leg space shall be provided for the driver when he is seated. The general layout and arrangement of equipment in Driver's cab shall follow UIC CODEX 651 with respect to dimensions, safety features, furnishing, lighting, ventilation, noise level, field of view, driver's desk, seats etc. Spot lights shall be provided at suitable locations. The cab shall be ergonomically designed for better view and comfort and also the various panels /equipment's meant for Driver shall be so laid that they are easily readable and Driver is not required to move physically for any operation during run.
- ii) Foldable cushion sheet shall be provided in each of the driving cabs for 4 persons in addition to the Driver.
- iii) All controls, brake handle, hand brake, Dead Man's device for horn and indication lamps/meters shall be within easy access and view of the Driver.
- iv) The OHE car shall be equipped with inter-communication equipment between cabs, Inspection compartment, working platform through hand free sets with their own battery.
- v) Each driving cab shall be provided with one number 6 Inch TFT monitor connected with one number portable CCTV camera for viewing roof activities during OHE maintenance.
- vi) 2 numbers, 110 V sockets for hand signals in each cab.
- vii) Head Light, Flasher lights search lights and marker lights at both ends of the cab, refer para 4.5.
- viii) Non-contact type OHE voltage sensing device in both the cabs.
- ix) Full width single piece Stone proof lookout glass with Sun Screen shall be provided at the end wall of each Driver's compartment and these shall be glazed, clear, colourless polycarbonate to ICF Specification No.ICF/MD/SPEC-159 (latest revision).
- x) Provision of wind screen Wiper arm and blade Assembly to be provided as per RDSO Specification no.C-K306 (Rev 01).

2.3.2 It is proposed to keep one drum each of contact and catenary wire, duly mounted on the stand, for erection during the restoration of breakdowns. Provision shall be made for rotating the contact wire drum by 180 degree for matching contact wire groove in either direction is possible so that it shall be possible to pay out the wire in either direction. Stands shall be provided with hand brakes to control the tension in the wires during the laying out process. It shall be possible to lay-out wires in either direction and therefore these drum shall preferably be in the middle of the OHE car. The drums be loaded from a sliding door of adequate size on both sides. The laying out of the wire shall be from two of the openings of suitable size in the roof vertically above each of the drums. These openings shall normally be covered so as to prevent water falling into the OHE car.

2.3.3 Successful tenderer shall submit mounting drawings for conductor drum as per principle details given below for approval of RDSO.

The principal details of the conductor drums are-

- (a) Diameter 1900 mm
- (b) Width- 950 mm
- (c) Bore for mounting on the stand- 105 mm x 105mm
- (d) Facility shall be provided to rotate the conductor drums to enable pay out the conductor in either direction

2.3.4 The facilities to be provided in the OHE Car shall be as described briefly in the following Clauses.

2.3.4.1 **Material Cabin:** A material cabin shall be provided adjoining one of the driving cabs having adequate space and proper locking arrangement for the storage of costly equipment and fittings. A reasonable number of cup-boards having sufficient number of pigeon holes shall be provided inside the material cabin for storage of fittings, tools and tackles, lighting equipment and other fragile spares. Suitable shelves/racks shall also be provided for storage of about 50 MS tubes of upto 47 mm dia and upto 4m long, hangers for insulators, apart from these two steel almirah (with five shelves) shall be provided for keeping costly items & essential records.

2.3.4.2 **Workshop:** A well-ventilated workshop shall be provided in the middle equipped with exhaust fans, ceiling fans and windows, with a room for 4 persons to stand and work. On one side a workbench of size 2500mm x 900mm shall be provided. It shall be fitted with two vices to under take minor repair work along with one drilling machine. On the side opposite the workbench, racks/cup board shall be provided for tools and plant. Design/ drawings of these equipments shall be submitted to RDSO for approval.

- 2.3.4.3 **Storage space:** Adequate space shall be provided for installation and storage of equipment such as emergency lighting equipment and other items supplied with the OHE Car.
- 2.3.4.4 **Staff Cabins:** One cabin for Officers with four cushioned Berths and one Cabin for staff (if possible) with two cushioned Berths shall be provided. The Cabins shall have separate entry and have windows on both sides. The Cabins shall preferably be not over the wheels as far as possible. An over head Tank, Stainless Steel Sink shall be provided. Provision of two Mobile Charging points to be made in Officer and Staff's Cabin as well as in both the driving cab and working area. In addition two folding berths shall be provided at suitable location without cabin.
- 2.3.4.5 **Communicating doors:** Each driving cab shall have independent entry from both sides. The OHE car lobby shall have entry from both the cab. Through communication inside the OHE car shall be provided. It shall be possible to isolate the cabins using sliding doors with locking arrangements.

### 2.3.5 Facilities on roof:

- i) The OHE car shall be provided with a pantograph similar to AM-12 type with foot insulators and its complete actuating mechanism on one bogie center. Pantograph shall be graduated to enable manual measurement of stagger on either side of track center.
- ii) For illumination of roof for night inspection six water proof industrial plug points shall be provided for fixing portable lights.
- iii) Two pneumatic points for connecting pneumatic operated/driven tools and fasteners shall be provided.
- iv) **Observation dome:** An observation dome shall be provided on the roof near the pantograph so as to observe interaction between the contact wire of the OHE and the pantograph. Two to three persons shall be able to sit comfortably in the observation dome. The upper portion of the dome shall be of polycarbonate /FRP with reinforcement if required for adequate strength and shall also be insulated for 25 KV. The arrangement shall be such that an unobstructed view of the contact between contact wire and pantograph is obtained by the persons in the observation dome without any strain. For this it is essential to have suitable ergonomic design of sitting arrangement. The chair provided in the observation dome shall have adjustable height, back rest with back and front adjustment just like in an automobile OHE car.

v) **Lifting and swiveling platform:** A lifting and swiveling platform with hydraulically operated mechanized adjustment for height and rotation and capable of taking minimum 600 kg load with under-noted features shall be provided over the fixed platform:-

- |  |                 |
|--|-----------------|
| (a) Length   | 5700 mm         |
| (b) Width  | 1500 mm         |
| (c) Platform floor level above rail when elevated.                           | 6150 mm         |
| (d) Maxim lifting time to full height  | 45 s            |
| (e) Rotation range of Platform towards sides.                                | 90 <sup>0</sup> |
| (f) Side shifting reach of platform  | 4200 mm         |
| (g) Full height of collapsible railing above platform floor                  | 800 mm          |
| (h) Maximum time of rotation from 0 <sup>0</sup> position to 90 <sup>0</sup> | 45 s            |

**NOTE:**

- (i) Control for lifting, lowering and swiveling shall be provided on the platform. The raising and swiveling of the platform shall be gradual and without jerks. In addition two emergency stop switches shall be provided on each side of the platform to bring the OHE Car to an emergency halt.
- (ii) Two search lights of 250 W metal halide lamps shall be provided on the platform for inspection of the overhead equipment while on the run. Searchlights shall be capable of swiveling on universal joints type support and swiveling control shall be from inside of the either cab.
- (iii) Except space for pantograph and observation dome the remaining roof shall be covered with a 2325mm wide fixed working platform at maximum possible height but within the maximum moving dimensions. This fixed platform shall be provided with four approach ladders, two on each side to climb on to the platform from the ground.

2.3.6 Provision shall be made to carry 3 OHE masts of 9.5 m and 1of 12 m lengths. The masts may either be rolled I beam of 150mm x 200mm size or fabricated structure of 250mm x 300mm.

- 2.3.7 Suitable safety measures including interlocks between various equipments, access doors and line equipment shall be provided to ensure.
- (i) Safety of men and
  - (ii) Stability of the OHE Car while in operation.

The tenderer shall indicate the proposed interlocking and safety aspects.

- 2.3.8 The entire OHE Car including bogies, superstructure alongwith equipment is to be effectively earthed as per standard practice for rolling stock. Schematic and other detailed drawings for earthing shall have to be got approved by RDSO.
- 2.3.9 The equipment fixed to the underframe shall be secured properly by providing extra metallic chains of adequate strength to safeguard the equipment and to perform efficiently.
- 2.3.10 Fire prevention OHE Car shall suitably be provided as per RDSO's Specification No.RDSO/PE/CP/EMU/0001 Rev.0 of Aug.'2003 (Amendment No.1 of July'2006) and with latest revision



**Chapter - III****3.0 MECHANICAL DESIGN****3.1 Superstructure:**

3.1.1 **General:** The OHE Car shall be of welded light weight construction, generally to maximum moving dimensions to diagram 1D of Indian Railways Schedule of Dimension 1676 mm gauge (BG) revised 2004 (SOD) with pantograph and platform in lowered condition. Infringements, if unavoidable and fully justified, may be considered, if within limits shown in the SOD. Weight of the OHE Car shall be kept as low as possible, without compromising with the strength. The structure shall withstand end load of 200 t (divided equally between the two buffers) applied in conjunction with full payload. Under such loading no permanent deformation should occur and stresses should remain below the yield point. The design shall be sufficiently rigid to withstand stresses imposed due to lifting with overhead or breakdown cranes or by jacks applied to the headstocks. The super-structure shall be designed as a tubular girder for the purpose of withstanding vertical loading, but the inner sheeting of the roof and walls shall not be stress-bearing members.

- 3.1.2 The under frame shall be designed to meet the following loads:
- i. A vertical load of 4 t/meter run uniformly distributed. The weight of the various equipment mounted in the OHE car shall be considered as concentrated load and shall be simulated as such during load/strain testing.
  - ii. A horizontal squeeze load of 100 t applied at each buffers.
  - iii. A combination of loads specified at (i) & (ii).

3.1.3 The stresses estimated by an approved method shall not exceed 139.3 MPa (14.2 kgf /sq.mm) for members made from Steel to IS:2062 Fe 410CuWC and 221.7 Mpa (22.6Kgf/ sq.mm) for members made from corrosion resistant steel to IRS:M 41 for the uniformly distributed vertical load. Also for the squeeze load referred to above, the stress should not exceed 90% of the lower yield point or proportional limit of the material in the load OHE carrying member of the shell and 95% of the lower yield point or proportional limit of the material in the end construction. The estimated vertical deflection of the shell at the center of the OHE car shall also not exceed 10mm under any loading condition detailed at (i) to (iii) above.

Completed shell of prototype OHE car shall be strain gauged for stress analysis under tare and loaded conditions with squeeze load. OHE Car shall be tested for leakage through roof and body sides and ends at the works of the manufacturer. To OHE carry out this test, the manufacturer shall provide a test rig to the satisfaction of the inspecting authority.

#### 3.1.4 **Side and End Wall:**

- (i) **Material:** The frame work shall be of low alloy high tensile corrosion resistant steel to IRS M-41 with latest revision/amendment.
- (ii) **Side wall and pillars:** The material of body pillar shall be IRS M-41. Pillars shall be continuous from sole bar to cant-rail, except below window openings, and shall be braced by longitudinal members between adjacent pillars. Bracing being designed to act as integral part of the exterior sheathing. Manufacturer can use better material than IRS: M-41 for body pillar but without cost implication and supplier shall provide proof of better material.
- (iii) The frame work shall be of low allow high tensile corrosion resistant steel to IRS: M-41 with latest revision.

3.1.5 **Body shell Structure:** The body shell including sheathing shall be of IRS: M 41 steel.

3.1.6 **Underframe:** The underframe material shall be of corrosion resistant structural steel to IRS: M 41 or copper bearing quality steel to IS: 2062 Cu WC, of welded integral structure. The under frame design shall be developed by the successful Tenderer keeping in mind the layout of DETC. The successful Tenderer shall submit under frame design to RDSO for approval at the time of design approval stage. They shall be assembled in jigs and fabricated by welding. Trough floor of 2.0 mm thick of steel to IRS: M 41 steel shall be provided in covered area.

3.1.7 **Headstocks:** These shall be of robust design suitable for coupling and buffing gear arrangements as detailed in this specification. Head stock material shall be IRS:M 41 steel.

3.1.8 **Draw gear members:** The members provided for OHE carrying the trimmer casting shall be of strong and rigid construction capable of transmitting buffing forces specified in Clause - 3.1 under the most adverse operating conditions. They shall be braced together to the main sills in such a manner as to form, in conjunction with the flooring system between the transom and headstock a rigid assembly capable of withstanding all cross-racking forces, which may occur in service. The design shall, as far as possible, ensure that the load is applied symmetrically about the neutral axis of the longitudinal and is concentric to them.

3.1.9 **Draw & Buff Gear:** The OHE Car shall be provided with high tensile centre buffer transition coupler conforming to RDSO Specification No.56-BD-07 along with the side buffers arrangement to RDSO's

Drawing No. SK-98145. The arrangement shall be such that OHE Car shall be able to couple with existing BG rolling stock of Indian Railways.

- 3.1.10 **Lifting Pads:** The OHE Car body shall lend itself to repeated lifting in workshop by overhead cranes or jacks without risk or damage. Suitable lifting pads shall be provided and marked in a readily distinguishable manner on the OHE car body.
- 3.1.11 **Solebar:** These shall be continuous members from headstock to headstock, adequately braced together to withstand the head on loading and cross racking forces and shall be capable to withstand jacking for the purpose of lifting the OHE Car. The sole bar shall be of corrosion resistant structural steel to IRS: M 41 Steel. The successful Tenderer shall submit the design/drawing of Sole Bar to RDSO for approval at the time of Design/Drawing approval stage.
- 3.1.12 **Body bolster:** These may be fabricated from pressed section and shall have suitable pads on which lifting slings may be placed. Body bolster shall be of copper bearing quality steel to IS:2062 Cu WC of welded integral structure.
- 3.1.13 **Floor bearers:** The design of floor bearers shall include robust main floor bearers placed transversely between the main sills and an adequate numbers of racking panels between the main sills and diagonal braces. The transverse floor bearers shall be so designed to OHE carry the maximum super-imposed load under maximum load conditions as well as bracing between the main sills, and shall be flushed with the top faces of the main sills, and a suitable surface for the floor covering. The design shall generally ensure adequate drainage, so that corrosion is avoided, or is confined to parts, which can be readily renewed without affecting the main flooring members. Floor bearers shall be conforming to IRS: M 41 steel.

### 3.2 Roof:

- 3.2.1 The roof shall be designed to form a satisfactory chord to the superstructure considered as a girder, and to take a concentrated load of 6 men standing (450 kg), close together at any point. The structure shall consist generally of two main longitudinal members running from end to end of the OHE Car, braced at frequent intervals along their lower flanges, and rigidly connected to the arch bars, and to the grab pillars by rigid transverse members. At partition and semi bulkheads, the sills shall be attached to vertical pillars within or forming part of the partitions or semi-bulk-heads The roof top at both ends i.e. back & front ends shall be flat. Roof should be so designed that no water is accumulated in cavities to avoid the damage/rusting. Proper channels to be provided for easy exit of rain water. The construction through out shall be absolutely watertight and shall permit easy renewal of

- corroded sheets. The material of the roof shall be of IRS: M 41 steel sheet.
- 3.2.2 Two (02) openings shall be provided in the roof for erection of catenary and contact wires in either direction. The openings shall be of suitable size to permit paying out of the conductors in any direction, when the OHE car is moving slowly at 5-10 km/h speed, without any obstruction, rubbing or scrapping.
- 3.2.3 **Roof Ventilators:** Roof ventilators shall be provided as per the ICF Drawing No WL.RRM4-7-3-401 with latest alteration shall be used. The ventilator shall not violate the schedule of dimensions & drawings to be got approved from RDSO.
- 3.2.4 **Air Space:** The air space between the outer and inner sheeting of the roof shall be suitably ventilated as also the air space inside walls and end walls. Attachments may pass through the air space as required, but must be designed, so that they do not cause sections to form sealed chambers or lodgments for condensed moisture. The successful Tenderer shall submit the design/drawing to RDSO at the time of design/drawing approval stage.
- 3.3 Windows:**  
Lift type window made of powder coated aluminum to ICF drawing No EMU/4C/ASR-5-4-402 with latest alteration with fixed type poly carbonate louver on top and movable glass window at the bottom.
- 3.3.1 All window and door glasses shall be of laminated plate glass set in sun heat resistant synthetic rubber section.
- 3.3.2 All window openings shall be true to dimensions square and of uniform width. The window opening shall not at any point exceed 2mm over or under the specified dimensions and shall not be out of square by more than 2mm.
- 3.3.3 The windowsills of the body side windows shall have an outward slope of approximately 5°.
- 3.3.4 The body side windows shall have two shutters, one louver on the outside and a glass on the inside.
- 3.3.5 The glass used for windows/shutters shall be of safety laminated quality to IS: 2553, weighing not less than 9.76 kg/m<sup>2</sup>. Gravity safety latches of approved design shall be provided at two intermediate positions to arrest the glass and louver shutters from falling down. The shutters should be balanced by balancers of suitable Design.

3.3.6 The louver shutters shall be provided with shoot bolt type safety latches to secure the shutters firmly in closed and open position.

### **3.4 Doors:**

3.4.1 All door openings shall be true to specified dimensions and perfectly square. The openings shall be tested for size and squareness with templates so that doors open and close freely and when closed shall be reasonably weather proof and dust proof.

3.4.2 Hinged doors provided on the side walls for entry of drivers from outside of the OHE Car shall be of inward opening type and will give an opening of 750 mm approx.

3.4.3 Single leaf inward opening hinged or sliding doors with locking arrangement shall be provided in driver's compartment for entry in the corridor and shall have a clear opening of 550 mm.

3.4.4 Other doors on sidewalls shall preferably be of sliding type with a clear opening of 1300 mm. The door leaves shall slide on roller bearing OHE carriers suspended from top rail and shall work in retaining guides on the doorsills. Each leaf shall have a window opening. Since the tenderer is expected to develop layout, location of doors may be decided in the most suitable manner.

3.4.5 Latches shall be fitted on all doors so as to secure them from inside in the closed position.

3.4.6 **Door locks:** All doors shall be fitted with reliable locks to be operated from outside and inside. Hasps for external padlocking shall also be provided on all doors opening out of the OHE car.

3.4.7 **Door Footsteps:** The door footsteps assembly shall be of mild steel chequered plate of 6.0 mm thick edges shall be protected with metallic treads. Any other suitable arrangement shall also be considered.

3.4.8 **Door handholds:** Door hand holds of chromium plated steel tube, with malleable cast iron brackets shall be provided on either side of all body side doors and shall be so fitted as to clear the side walls sufficiently to prevent injury to knuckles. Hand holds shall also be within the OHE car profile.

**3.5 Roof Water Tank:** Roof water tank 4 mm thick of aluminum not less than 450 liters capacity shall be provided. The tank shall be mounted so as to be readily removable for repairs. Side filling arrangement only shall be provided for water filling. The water tank shall be tested to hydraulic pressure of 0.35 kg/cm<sup>2</sup>. The inside of all water tank shall be painted with bituminous , black lead free, acid, alkali, water and

chlorine resisting paint to IS:9862-1981 and properly dried before assembly in the car.

### **3.6 BOGIES:**

- 3.6.1 General Design: OHE Car shall have two 4-Wheeled Bogies of robust welded design suitable for taking brake gear, suspension etc. and capable of withstanding the maximum static and dynamic stresses under its full load condition. The weight of the Bogie shall be as low as possible, consistent with strength and robustness. The bogie frame shall be of copper bearing steel plates to IS: 2062 Fe 410 Cu WC and shall be fabricated by welding.
- 3.6.2 Bogie suspension Design shall be coil steel suspension in primary and air spring suspension in secondary stage. The Bogie Design shall be as per ICF Drawing No AC/EMU/M/ASR-0-0-001 with latest Alteration. The manufacturer of diesel electric tower car shall purchase bogie frame alongwith its accessories from the approved Vendors of Indian Railways.
- 3.6.3 The design shall be capable of negotiating curves of 175 m radius, turnout of 1 in 8 and 1/2 and gradients of 1 in 100.

### **3.7 WHEEL, AXLES AND AXLE BOXES**

- 3.7.1 Wheel and axle dimensions shall meet the requirements of Indian Railways Schedule of Dimensions 1676 mm gauge-(BG) revised 2004.
- 3.7.2 Wheel assembly shall be 952 mm diameter and shall be provided with roller bearing no.22328 C/C3. The wheels of tower car shall be solid forged wheels to RDSO drawing no.SK-K4004 with latest alteration. All wheel sets shall be machined to take a speedometer drive.
- 3.7.3 Axles shall be to IRS-R43/92 stress calculations /FEM of wheel and axles shall be submitted. The calculation shall be done as per ARR/UIC Specification.
- 3.7.4 The wheel profile shall be to RDSO sketch No. 91146 with latest alteration.
- 3.7.5 40% dynamic augmentation of the vertical journal in a load will be used in calculating the axle stress in addition to vertical and horizontal forces and movements.

- 3.7.6 All wheel and gear seats and traction motor suspension bearing journals are required to be cold rolled together with stress relieving grooves machined in the axle, between wheel seat and gear seat and between the wheel and traction motor suspension bearing journal of the axles.
- 3.7.7 Facilities for oil injection for removal of wheel shall necessarily be provided.
- 3.7.8 Standard axle boxes shall be used. Roller bearings will be grease lubricated and of type which have given satisfactory performance/ service on railway stock. Special attention shall be paid to sealing arrangement of the ends of axle, to prevent ingress of water, dirt and loss of lubricants. This aspect requires special attention as the axle box may remain submerged in flood water during heavy rains. The sealing arrangement shall ensure that axle box will not need special maintenance even if it is submerged in water. The design of labyrinth will be such as to prevent the ingress of dust in to or outflow of grease from axle boxes.
- 3.7.9 One of the axle box and cover (not the leading one) shall house speedometer generator with suitable adopter. Care shall be taken to provide special protection arrangement for the generator and cable connection against flying ballast and any other extraneous objects. The connection shall preferably be taken from the top of the axle box.
- 3.7.10 Complete working drawing of the axle box , guide arrangement with bearing and its components shall be submitted for approval along with maintenance instructions.
- 3.7.11 The axle box body shall preferably be of cast steel.
- 3.7.12 The contractor will be required to provide recommended lubricants which should have been proven in similar railway service of the axle bearings.
- 3.7.13 An alternative lubricant, manufactured in India shall also be identified by the contractor in conjunction with the bearing manufacturer, and the lubricants manufacturing industry.
- 3.7.14 Design calculation for the powered axle shall be submitted for approval of RDSO.

### **3.8 Brake System:**

- 3.8.1 The OHE Car shall be fitted with graduated release air brakes. The brake system shall be of UIC approved type and shall meet all UIC requirements. It shall have the following distinct positions.

- i) Release Position
- ii) Minimum reduction position.
- iii) Full service position.
- iv) Emergency position.

Note Panel mounted air brake system of approved make conforming to Specification. No. MP-0.01.00.19 (Rev-01), June'2010 as approved by RDSO or the latest RDSO approved design should be provided in order to achieve high reliability, low weight, better sensitivity and easy maintainability.

3.8.2 **Brake Blocks:** The composition 'K' type non-asbestos brake blocks to RDSO Specification No. C-9508 with latest revision/amendment shall be used. Brake rigging shall be as per ICF drawing No. EMU/M-3-2-064 with latest alteration shall be provided to prevent the brake blocks riding down the wheel tapers.

3.8.3 The Emergency Braking Distance (EBD) for fully loaded (20.32x4=81.28 t) OHE car from maximum speed of 110 km/h to zero shall not be more than 800 meter on flat section. The Tenderer shall also submit calculation for EBD on 1 in 33 down gradient.

3.8.4 It is proposed to use the OHE Car for hauling two wagons weighing 60t each in gross load condition [see Item-11 (vii & ix) of table at Clause 2.12(vii)]. The manufacturer shall indicate the Emergency Braking Distance that can be obtained with above loaded wagons in the rear in un-braked state.

3.8.5 The OHE car shall be provided with the following additional brake requirements:

- i) A D-1 Emergency Brake valve in both driving cab on extreme right hand side for emergency brake application.
- ii) Stand-by brakes, in case of failure of distributor valve or any component in the main brake system. This shall be decided at the design approval stage.
- iii) Parking brake to RDSO Specification No. CK 408 (latest revision) capable of holding fully loaded OHE Car with 120 t trailing load of two loaded bogie Flat Wagons in un-Braked state on 1 in 33 down gradient under wet condition.
- iv) Flexible Hose connection shall conform to SAE 100R1

3.8.6 Application of any type of brake provided on the OHE car shall result in simultaneous cutting of the power to the driving axles. Interlock for



- this arrangement may be included in governor system for safety precaution.
- 3.8.7 The brake rigging arrangements shall be light and as simple as possible with minimum number of levers and fulcrum points permitting easy access to brake blocks and other wearing parts. Composite brake block shall only be used as per the standard approved drawing.
- 3.8.8 Brake system shall be provided with automatic slack adjuster built into the brake cylinder.
- 3.8.9 Adequate safety straps shall be provided below the moving components of the brake rigging and other components to prevent falling on the track in the event of failure of any component.
- 3.8.10 The supplier shall submit details of brake system covering brake schematic diagram, working principle, brake power diagram calculation for EBD, number, dimension and type of brake blocks and literature on brake equipments proposed along with offer and get the brake system approved from RDSO before manufacture of the prototype.
- 3.8.11 Air dryer of approved make conforming to Spec. No. MP-0.01.00.09 (Rev-05), March'2011 shall be provided. (In line with latest equipment on EMU/DEMU)
- 3.8.12 Main air reservoirs of adequate capacity shall be provided. In addition, a separate braking reservoir and a non-return valve be provided for braking only. Suitable drain valves/cocks shall be provided to drain off the condensate in the reservoir (s).Cut off cock may be provided at inlet of auto drain valve.
- 3.8.13 The tenderer shall be required to supply the detailed drawings, specifications and testing procedure for rubber components/parts of all the valves/cocks used in the brake system.
- 3.8.14 The supplier shall get the brake schematic approved by the RDSO.
- 3.8.15 Stand-alone VCD of approved make conforming to specification No. MP-0.34.00.04 (Rev.04) Dec 2008 shall be provided.
- 3.8.16 Brake system shall be such that in dead condition of 8WDETW can be hauled by another air brake stock.
- 3.9 Piping & Pipe fittings:**
- 3.9.2 Seamless stainless steel pipe bright annealed to ASTM A 269 Gr. 304, which can be bent cold shall be used. The layout of piping shall be designed to keep all pipes, especially the brake cylinder

- pipes, as short and straight as possible Bends should be used throughout, but where elbows have to be used; they shall be of round type. Where the pipes itself are bent, their internal area shall be maintained uniformly.
- 3.9.3 Double ferrule pipe fitting consisting of body, front ferrule, back ferrule and nut shall be provided. The body and nut shall be of carbon steel of ASTM:A-108 Grade -II with electro cobalt zinc plating with chromic passivation. The ferrule and back ferrule shall be made from stainless steel to ASTM A276 TP 316 SS and conforming to ICF Specification No. ICF/MD/SPEC-166 with latest revision/amendment.
- 3.9.4 All pipes shall be adequately clamped to the frame assembly. Compreg to RDSO Specification No. C-9407- type II shall be used for clamp.
- 3.9.5 Pipes, ducts and conduits shall conform to an identification colour scheme with polyurethane paint as per RDSO's Specification, which shall be approved by RDSO.
- 3.9.6 Chart showing the colours for identification of pipes shall be displayed in cab at a prominent place where it is likely to be needed for reference.
- 3.10 Interior furnishing:** The OHE Car shall be furnished with light weight fire retardant material. The material used for finishing and furnishing shall be suitable for use under Indian climatic conditions and shall be as for as possible fire proof, non-hygroscopic and vermin and rot proof. The furnishing shall be as agreed between the contractor and RDSO. It may be noted that presently 3 mm decorative/ resin bonded thermo-setting laminated plastic sheets of approved shades, possessing resistance to spread of flame as indicated in para 5.16 of IS:2046 are being used in Indian Railways and same to be provided for NTPC DETC. With a view to retarding the spread of fire, the continuity of LP sheets shall be broken by the provision of suitable metal barriers. The laminated plastic sheets conforming to STR No. C- K-514 (Latest Revision) may be used for thermosetting resin bonded Laminated Sheet for OHE Car.
- 3.11 Ceiling and paneling:** The ceiling in compartments shall be of minimum 2 mm thick NFTC to RDSO Specification No. C-K 511 (Latest Revision). The ceiling material shall be IRS M-41, wherever required.
- 3.12 Flooring Construction:** Floor of the vehicle shall be as per ICF drg. No. EMU/MASR-41-001 with latest alteration. The opening in the flooring for passage of pipes and cables through the floor shall be so constructed as to prevent any seepage of the oil. In addition to give effective protection against the spread of fire originating beneath the body.

**3.13 Extra Fitting:**

- (i) Door steps shall be provided at all body side doors.
- (ii) Continuous water wriggles from one end of the OHE Car to the other shall be provided.
- (iii) Tail lamp bracket to IRS Drawing No.C.BF-113 shall be fitted at each end of the shell.
- (iv) Rain water channels of suitable design over the doors & windows way shall be provided.
- (v) Tenderers may note that the OHE Car may be washed mechanically. Tenderers may also note that the exterior of the OHE Car may be washed in automatic OHE car washing plants. Exterior of the OHE Car shall be designed keeping this in view.

**3.14 Cattle Guard:** Detachable type cattle guards shall be provided under each buffer beam. The cattle guard shall be fitted with adjustable rail guards so as to maintain the minimum free space above the rails under all conditions (see item 7 of clause 2.0).Cattle guard shall be as per RCF Drawing No. EM26108 with Latest Revision.

**3.15 Insulation:** An insulation layer of suitable thickness of non-asbestos material shall be provided inside the OHE car shell. End walls and sidewalls shall be provided with suitable anti-drumming and anti-corrosive compound. Underside of the under frame over the engine area shall be properly insulated to minimize heat transfer to the compartment. The material used for insulation shall be non-inflammable type. All other parts shall be provided with anti-corrosive compound.

**3.16 Noise Suppression:** The tenderers shall indicate noise suppression features incorporated in the design. Maximum noise level should not exceed 75 dB inside the cab.

**3.17 Trap Doors:** Suitable trap doors shall be provided on the flooring for attention of underslungeequipments, during service. The design of trap door shall be such that it can be conveniently lifted when attention to equipment is required but strong enough to withstand normal passenger loading. The trap door shall remain in level to the floor of the OHE car.

**3.18 Anti-pilferage measures:** While securing compartment fittings, anti-pilferage measures shall be incorporated.

**3.19 Fire extinguishers and first aid equipment:** Four fire extinguishers CO<sub>2</sub> type of 5 kg capacity shall be provided, one each in both the cabs and two in workmen's lobby. Space shall be provided for keeping a first aid box and one stretcher.

**3.20 Corrosion protection:**

- i) Sheets and plates (other than Stainless Steel) used for OHE Car construction shall be suitably treated against corrosion before fabrication.
- ii) Sub- assemblies shall be treated against corrosion as per UIC Code 842-5 after they are manufactured.
- iii) OHE Car shall be treated after fabrication as per UIC Code 842-5.
- iv) In addition to above, the OHE Car design shall be such as to minimize the incidence of corrosion. Indian Railways experience is that most corrosion takes place due to seepage of water from the floor and window openings.
- v) The Tenderer may suggest any better corrosion protection system that he may have adopted with success in OHE Cars manufactured by him.
- vi) The Tenderer shall note that OHE car floors are washed regularly at certain time intervals. Hence the floor construction should be such that it does not permit water to seep through the floor and cause corrosion to trough floor and under frame members.
- vii) Tenderers may note that Indian Railway have noticed heavy corrosion on OHE Car under the lavatories. As such, corrosion resistant steel shall be used for construction of floor and adjacent members under lavatories and the neighboring bays.

**3.21 Information to be submitted by the tenderer**

- (a) The following information shall be furnished by the tenderer alongwith the offer:
  - (i) Transverse cross section of the proposed OHE Car along with principal dimensions so as to illustrate the general construction of the shell. Also superimposed upon this should be the schedule of dimensions as embodied in the Indian Railways Schedule of dimensions –1676 mm gauge, revised 2004. Infringements, if any, should be accurately defined in the sketch.
  - (ii) A "Section" view of the plan of the OHE Car, showing the layout of the major equipments along with principal dimensions.
  - (iii) Side elevation of the proposed OHE car.
  - (iv) A "Sectional" side elevation of the OHE Car underframe showing the disposition of the major equipments on the underframe.

- (v) To demonstrate his capability for designing OHE car body, the tenderer shall submit a set of actual calculations pertaining to OHE car structure for any bogie vehicle, designed by him in the past. These shall be submitted alongwith his tender offer.
  - (vi) The schematics of the brake pneumatic alongwith the internal schematics of the valves proposed to be used shall be furnished alongwith the tender. The schematics shall be accompanied with a write up on sequence of events during application, release and emergency.
  - (vii) Type of compressor and its capacity shall be indicated along with tender. This will be accompanied with a technical justification for the compressor capacity selected.
  - (viii) Estimated weight of the OHE car structure shall be furnished alongwith the tender. Also weights of principal assemblies mounted on the OHE car structure shall also be furnished.
- (b) The other relevant information but not limited to following shall be furnished at design approval stage by the successful tenderer.
- (i) A representative sectional view of the OHE car floor, illustrating the floor construction. The specifications of the materials used in its construction should be identified.
  - (ii) Furnishing material intended to be used by the tenderers-specifications should be identified.
  - (iii) Insulating material proposed by the manufacturer specifications should be identified.
  - (iv) Ceiling material proposed to be used by the manufacturer specifications should be identified.
  - (v) Principal features of noise suppression shall be identified and submitted.
  - (vi) Principal features showing adequate fire redundancy shall be identified and submitted.
  - (vii) Tentative brake rigging diagram alongwith details of brake cylinder and slack adjuster proposed to be used shall be submitted.
  - (viii) In case parking brakes are proposed the features of the proposed parking brake actuator, its type and the schematics shall be furnished.

**3.22** The guaranteed technical particulars of the inspection OHE car shall be submitted as per Annexure-7.

**Chapter - IV****ELECTRICAL EQUIPMENTS**

4.0 **Illumination:** Driving Cabs, officers/Staff cabins, Workshop & Storage space shall be provided with level of Illumination of at least 30 Lux at the working plane level (1m above the floor level).OHE Car lighting shall be provided with 18 W, 600 mm x 26 mm double capped Fluorescent tube lights with wire mesh guard along with its fittings and Electronic Lamp ballast as per RDSO Specification No. RDSO/PE/SPEC/TL/0011-2000 (Rev.1) with the latest revision shall be used.

4.1 Driving cabs, officers/staff cabins and workshop shall be provided with two, 110V, 300 mm sweep fans conforming to IS: 6680.

4.2 **BATTERY:** Lead Acid maintenance free storage battery of capacity as mentioned at Clause no.5.3.2.20 of Chapter-V, conforming to IS: 6848-1972 shall be provided in under slung Battery boxes. The Battery fuses shall be located close to the battery terminals.

4.2.1 Terminals for charging the batteries from external charging equipment shall also be provided. The location of the batteries shall be such that there is no danger of their getting damaged due to tools and equipment inadvertently falling on them. If the cells are packed in two rows in the battery box, a hylam sheet shall separate the two rows.

**4.3 Alternator for battery charger & DG sets:**

4.3.1 An engine mounted alternator with rectifier and regulating equipment of suitable capacity for charging of 24 V DC 290 Ah Battery shall be provided. The output of the generator shall cater for battery charging for diesel engine starting (battery voltage 24V). The maximum power demand will be required when the OHE car is stationary and with engine running at low idling speed.

4.3.2 An engine mounted alternator with Rectifier and regulating equipment of suitable capacity for charging of 24 V DC 290 Ah Battery shall be provided. The output of the Alternator shall cater for battery charging for diesel engine starting battery, 24V.

4.3.3 Battery charger for charging batteries of 110 V of 120 Ah capacity Lead acid maintenance free storage battery of capacity as mentioned at Clause No.5.3.2.20. The battery charger shall be from RDSO's approved vendors complying to the RDSO's Specification No. RDSO/PE/SPEC/AC/0008 (Rev.2) with Latest alteration.

4.3.4 A 10 kVA, 3-phase, 415V, low noise Diesel Generating set for power supply to lifting platform and machines in workshop shall be provided

with OHE Car. The Gen set shall be mounted on anti-vibration mounting to reduce the vibrations.

- 4.3.5 A skid mounted portable Diesel Generator similar to Honda make (petrol start petrol run) of 3kVA (minimum), 240V, 50 Hz along with transformer shall be provided to meet 150 Amps light weight IGBT based welding machine load and other auxiliary load of search lights (2x250 watts), emergency light and for other such purposes. Design of Transformer shall be decided at design approval stage.

#### **4.4 Circuitry**

- 4.4.1 The load shall be suitably distributed based on standard practice.
- 4.4.2 Electrical equipment such as switches, lamp holders and other items shall conform to the following latest Specifications:
- IS:6965: Switches for use in Railway stock.
  - IS:1258: Bayonet lamp holders.
  - IS:1293: Three pin plug and socket outlets.
  - IRS: EA-199: For ceiling light fittings like CFL within transparent enclosure.

#### **4.5 Power for head lights, tail lights**

- 4.5.1 Following lights shall be worked on the alternator/ rectifier provided with diesel engine. This is to ensure that failure in the other lighting system does not affect the mobility of the OHE car.
- 4.5.2 **Twin beam Head light:** Twin Beam head lights shall be provided at both ends. The head light shall conform to RDSO's Specification No. ELRS/SPEC/PR/0024 (Rev-1) Oct. 2004. The operating voltage of head light shall be 24 V DC. 24 V DC, supply for twin beam head light shall be taken from 110/24 DC-DC convertor. DC-DC Convertor shall be as per RDSO's Specification No. ELRS/SPEC/DC-DC Convertor/0021 Rev.1.
- 4.5.3 **Tail light:** Tail lamp (Red aspect) of LED type 24 V 15 W as per RDSO's Specification No. RDSO/PE/SPEC/TL/0119-2000 (with latest revision) shall be provided at each end to comply with General & Subsidiary Rules of Indian Railways.
- 4.5.4 **Flasher light:** One flasher light each of LED type as per RDSO's Specification No ELRS/ SPEC/LFL/0017 (Rev-1) Sept, 2004 shall be provided on the roof at either end of the OHE car.
- 4.5.5 **Marker Light:** Marker light of LED type (Red aspect) as per RDSO's Specification No ELRS/SPEC/PR/0022 (Rev-1) Oct. 2004 shall be provided on either end of the OHE car.

- 4.5.6 **Search Light:** OHE car shall be provided with two 250 Watts searchlights with Metal Halide lamps, one on each end, for inspection of the OHE while on the run. Searchlights shall provide a high intensity illuminating beam and capable of swiveling on universal joint type supports. Design details shall be finalized at the time of design approval stage.
- 4.5.7 **Wiring-**All Electrical wiring in the tower wagon shall be done with e-beam cables conforming to RDSO's Specification No ELRS/SPEC/ELC/0019 Rev.-1 dated 06.07.2010 with latest amendment.
- 4.5.8 **Horns:** The OHE car shall be fitted with two horns at the roof with different tones on both sides. Horns shall be operated on compressed air. These shall be operated by a hand switch provided within the access of the Driver. Horn cover to RDSO Drawing No. CG-K5056.
- 4.5.9 **SPEED INDICATOR / RECORDER:** Speed Indicator and Recording Equipment of 0 -160 km/h range shall conform to RDSO's Specification No.MP-0.3700-07 (Rev.03) of April'2003. One cab of OHE Car shall have one recorder-cum-indicator and the other cab shall have one speed indicator only.
- 4.5.10 **Mobile Charging:** Four mobile charging points one each in Staff Cabin and both the Driver's Cab shall be provided as per RDSO approved source.
- 4.5.11 **Cab Heaters:** Both the cabs shall be provided with electrical heaters to keep cab environment warm during winter season. The power supply to heater shall be given from the auxiliary alternators as specified in clause 5.9.1
- 4.5.12 **Flood lights:** Four flood lights giving diffused light of 75 watts shall be provided with each OHE car. Detailed design of it shall be finalized at the design approval stage.
- 4.5.13 **Emergency push-buttons (Mushroom Type):** Five emergency push-buttons shall be fitted on the chassis sides and one on the roof. When activated, they provoke: -
- (i) Idling of the engine & removal of excitation of alternator.
  - (ii) Stop of elevating platform.
  - (iii) Braking of the vehicle.

#### **4.5.14 Earthing Arrangement of Tower OHE Car:**

All metallic parts of tower wagon including the working platform, shell structure & bogie shall be integrated electrically to ensure proper earthing of tower OHE car through wheels to Rail. The body of the



lifting motor, control panels, swiveling motor at platform and other electrical equipment shall be connected to the earth. Traction motor shall be provided with earth brush. The schematic diagram of earthing arrangement to be provided for the tower OHE car& equipment in it shall be submitted by the successful tenderer for approval of RDSO.

**Chapter - V****5.0 POWER EQUIPMENT & CONTROL**

**5.1** The different speeds of the twin-power pack from idle to maximum speed and the corresponding power developed should be so selected that all the conditions mentioned in Clause - 2.0 of Chapter-II can be satisfactorily met. However the number of speeds and power levels chosen should not be less than 8 (herein after referred to as notch positions) in addition to the idle position. The performance of the power pack shall be optimum in each notch position in addition to being able to meet the traction load and demand by the auxiliaries.

**5.2** Detailed calculations shall be submitted along with tender indicating the power demand by the traction motors for different conditions and the demand on the power pack. These calculations shall indicate whether adequate reserve power has been provided. Characteristic curves for the Traction Alternator & Rectifier indicating the performance for different notch positions should be furnished. These curves, inter-alia, should indicate speed, BHP, power consumption by auxiliaries, excitation voltage and a.c. and d.c. currents. These characteristics should clearly indicate the extent of matching or mismatching of power.

**5.3 DIESEL ENGINE AND TRANSMISSION SYSTEM**

5.3.1 The OHE Car will have two independent diesel electric transmission systems, each comprising a diesel engine, an alternator along with its power rectifier, two traction motors mounted on one bogie, auxiliary alternators with their rectifier-cum regulator units, engine and traction controls, synchronised for operation from a common master controller from the driving cab(s). In case of failure of one of the transmission systems, provision shall be made so that the same can be isolated and the OHE car can still be worked at reduced power from the healthy transmission.

**5.3.2 Diesel Engine**

5.3.2.1 Two independent under-slung naturally aspirated, turbo-charged and after cooled Diesel Engines of proven design of Cummins make NTA- R or similar other reputed make suitable for 8-Wheeler Diesel Electric Tower Car, complete with all accessories, suitable for traction service under the climatic and operating conditions obtained in India, shall be provided.

The continuous traction rating of each engine shall be 340 hp (approximately) or higher at 1800 rpm after due de-rating for environmental temperature of 55°C. It shall be battery started. Specific Fuel Consumption (SFC) shall be low. Robust construction, low maintenance and satisfactory record of past performance are of

- paramount importance. Tenderer shall furnish full particulars of the engine with the offer. Adequate allowance shall be made in the power of the diesel engine for the de-rating under most adverse climatic conditions stated in Clause-1.2 of Chapter-I of this specification. Successful tender shall give detailed calculations for engine's suitability and its rating.
- 5.3.2.2 The supplier shall indicate the total horse power required for the auxiliaries with the break up power for each of the auxiliary machines at rated output.
- 5.3.2.3 The tenderer shall indicate the net horse power available for input to traction under the conditions mentioned under para-1.2 of Chapter - I of this specification.
- 5.3.2.4 The idling speed of the diesel engine shall be such so as to match the requirement of various auxiliary machines driven by the engine.
- 5.3.2.5 The Diesel Engine shall work satisfactorily with fuel oil to Indian Standard Specification No.1460-grade A, but shall also be able to function in a trouble free manner even with Grade B fuel oil to the same Specification.
- 5.3.2.6 Suitable hand priming pump shall be provided to avoid air lock in the fuel system.
- 5.3.2.7 The engine shall be provided with suitable end on mounting arrangement to SAE-O dimensions for coupling with and driving the traction alternator. The mounting and coupling arrangement shall be of adequate capacity to withstand high deflection and torque (at starting, stopping and due to misfiring of cylinders) so that no damage is caused to the alternator and engine components in service.
- 5.3.2.8 The drive gear for driving compressor, auxiliary alternator and electric fan drive for the radiator shall also be in the scope of supply of the tenderer.
- 5.3.2.9 Detailed torsional vibration analysis of the complete system under normal engine working as well as under conditions of one cylinder misfiring for the complete operating range including 10% over speed shall be furnished.
- 5.3.2.10 Air inlet to the engine shall be from inside the OHE car with proper ducting arrangement from the filters.
- 5.3.2.11 Piping from the air cleaner to the turbo-driven air handling unit shall be in the scope of supply.

- 5.3.2.12 The exhaust pipe shall not leave carbon soot on important assemblies like traction motors, axle drive etc. The exhaust pipe shall be taken horizontally and located under floor avoiding the position near footsteps of the vehicle with adequate insulation to withstand 700°C.
- 5.3.2.13 Filters shall be of adequate air flow capacity/filtering efficiency to ensure satisfactory performance under dusty environment.
- 5.3.2.14 The tenderer shall submit graphs showing the BMEP/engine output torque and SFC at all notch positions from idling speed to rated speed.
- 5.3.2.15 Lube oil consumption at rated output as a percentage of the fuel oil consumption should also be indicated.
- 5.3.2.16 The tenderer shall furnish a copy of the Type Test report of the engine by a statutory body in support of their claim regarding performance, reliability and specific fuel consumption. In case the engine offered is not type tested earlier, the testing shall be done in the presence of RDSO's representative. In case engine is already type tested and found satisfactory then routine test report is to be submitted for all the engines by the firm to the purchaser. RDSO may like to conduct acceptance test, if required.
- 5.3.2.17 Fuel tank of at least 700 liters capacity indicating tower wagon's operating time with 700 liter fuel oil to be given.
- 5.3.2.18 The noise level in the driver's cabin with the doors and windows in closed condition shall be less than 75 db (A) and in the inside of the OHE car shall not exceed 80 db (A) at maximum output and speed of the engine.
- 5.3.2.19 The exhaust emission shall be below the limit laid down in UIC/ORE No. B13/RP22/E Clause-4 of the entire engine range of operation from idle to full power and shall be measured as per UIC/ORE/B13/RP21E. The exhaust opacity shall not exceed 20 as measured by Hartridge smoke Meter or equivalent scale under all conditions including acceleration of the engine. A suitable catalytic converter shall be connected in exhaust pipe to limit the emission.
- 5.3.2.20 The tenderer shall supply the complete system including engine starter and battery chargers. Batteries shall be of following ratings:-
- (i) 24 V, 290 Ah batteries of RDSO's approved make for Engine cranking.
  - (ii) 110 V, 120Ah battery of RDSO's approved make for Control and auxiliary circuits.

- 5.3.2.21 Suitable anti-vibration mountings for the engine, alternator, auxiliary alternator, and compressor shall be used. The anti-vibration mountings (AVMs) shall be of approved make. The type and number of AVMs offered shall be specified. To meet the vibration limit, any increased numbers if required shall be to the contractors account. The deflection characteristics of the AVMs shall be submitted.
- 5.3.2.22 Drawings for the suspension brackets shall be got approved by RDSO before manufacture/ supply.
- 5.3.2.23 All threaded fasteners shall be of RDSO approved make.
- 5.3.2.24 The engine manufacturer shall provide necessary safety devices to protect the engine against hot engine, low lube oil pressure, engine over speed and low water levels etc. two high water temperature thermostats with 5<sup>o</sup>C difference in setting shall be provided.
- 5.3.2.25 List of all accessories that are offered with the diesel engine, clearly indicating those mounted on the engine and those supplied loose shall be furnished by the tenderers.
- 5.3.2.26 Electrically operated gauges for the various indication requirements and fault indication lamps shall be provided in each driving cab.
- 5.3.2.27 The stopping of the engine shall be by de-energising a fuel solenoid valve.
- 5.3.2.28 The initial fill of lube oil for the engine as recommended by the engine manufacturer shall be in the tenderer's scope of supply.
- 5.3.2.29 The tenderer shall submit along with the offer, complete engine data as per Annexure - 3, as applicable to the Engine offered.

#### **5.4 COOLING EQUIPMENT**

- 5.4.1 The Cooling Equipment shall be guaranteed to work efficiently under the climatic conditions specified in para-1.2 of Chapter- I of the specification. The radiator and fan shall be of adequate capacity with 30% choked condition of the radiator used. Air flow required for the radiator fan shall be at least 15% more than that actually required to make up for any reduction in air flow due to train movement. The limiting ambient capability of the cooling system shall be minimum 55 <sup>o</sup>C with 30% choked condition
- 5.4.2 The complete technical details of the radiator and its fan shall be furnished.

- 5.4.3 Two independent sets of cooling equipment (i.e roof mounted radiator, hydraulic tank, hydraulic oil cooler and water pipes) shall be provided. The individual radiator will take care of the cooling requirements of respective engines and the hydraulic cooler.
- 5.4.4 The maximum operating water temperature shall normally not exceed 95°C. There should be provision of alarm and shut off at higher temperature.
- 5.4.5 The radiator shall be roof mounted either with proven electric fan drive system or hydraulic fan drive arrangement which shall have thermostatic control to regulate the fan speed depending upon the water temperature shall be provided. Complete technical details of the radiator and its type of fan & drive shall be furnished to RDSO. The most suitable and reliable design and type of fan & drive shall be selected at the design approval stage. If there is any cost differential for electric driven radiator cooling fan and hydraulic driven radiator cooling fan shall be clearly indicated by the tenderer.
- 5.4.6 Suitable water raising apparatus, using mono block pumps for topping up the water in the radiator shall be in the scope of supply. A stainless steel tank for the radiator of not less than 100 litres capacity shall also be provided.
- 5.4.7 The installation drawings of the radiator and fan with details of fan drive shall be supplied by the tenderer.
- 5.4.8 Cooling Proving trials shall be carried out in a test bed at the firm's premises (OEM) to prove the adequacy of the cooling system comprising of radiator and hydraulic oil cooler for the prototype in the presence of RDSO's representative. The procedure for such testing shall be submitted and got approved from RDSO.
- 5.4.9 The following calculations in support of offered cooling system shall be submitted:
- Cooling requirement for all sources of heat (with break up)
  - Heat dissipation characteristics of the radiator and its resistance characteristics.
  - Radiator fan characteristics showing the air flow Vs total heat at different speeds.
  - Cooling system-matching calculations.
  - Schematic cooling circuit diagram showing water, oil and air flow through each equipment.
- 5.4.10 The tenderer shall submit drawing for mounting details of radiator assembly, fan drive arrangement and ensure that these fit completely within the overall dimensions of OHE car and shall be got approved by RDSO.

### 5.4.11 Compressor

5.4.11.1 Two engine driven air-cooled compressors (one with each engine) of adequate capacity and complete with all accessory suitable for continuous operation at a nominal maximum pressure of 8 kg/cm<sup>2</sup> shall be offered. The capacity of the air compressor shall not be less than 10 cfm at engine low idling speed. The essential accessories as under shall also be in the tenderer's scope of supply:

- i) Suitable after cooler.
- ii) The compressor shall be provided with suitable governor to cut in and cut out at 7 kg/cm<sup>2</sup> and 8 kg/cm<sup>2</sup> respectively and a safety valve set at 8.5 kg/cm<sup>2</sup>.

Note:

- i) The compressor capacity and expected power consumption shall be specified at low idle and max operating speed of the engine.
- ii) The compressor offered shall be of proven capability in Railway Rolling stock application.

### 5.5 Engine Control

5.5.1 The engine shall be electronically controlled using suitable and proven ECUs.

5.5.2 The engine control system should return the engine to idling (no traction load) position in case of emergency brake application.

5.5.3 Electronic Governing system for engine control (LCC) as well as main traction alternator excitation control shall be provided.

5.5.4 Tenderers shall indicate notch wise speed and power of the engine offered.

#### 5.5 A Tests on Diesel Engine:

- i) Type, Routine and acceptance Tests on the Diesel Engine shall be performed in accordance with International Union of Railway Code No. UIC-623 OR with latest Edition. Para nos 4.3.2, 4.3.3, 4.3.5 of UIC-623-2 OR should be followed for test on Diesel Engine.
- ii) The type tests shall comprise of 12 hours running of Engine load cycle 100%, 110%, 75% and 50%.
- iii) At the end of run, the parameters like high idle rpm, low idle rpm and lube oil pressure at high and low idle rpm shall be recorded.
- iv) The Oil consumption test and Exhaust smoke shall be measured in accordance with BS standards.
- v) All the performance parameters shall be recorded measured in accordance with UIC-623-2 OR with latest edition.
- vi) The type test/routine test schedule shall be submitted and got approved from RDSO. The tests shall be carried out in presence of RDSO's representative.

## 5.6 TRANSMISSION SYSTEM

Three phase a.c./d.c. transmission system shall be used. The tenderer shall furnish full technical details as per Annexure-4 for the transmission system offered. Tenderer shall submit block diagram of power circuit for approval of RDSO.

## 5.7 Alternator

5.7.1 A three phase variable speed self-ventilated, self-excited, brushless and under slung traction alternator shall be provided (two Alternators per OHE Car). The Alternator shall either be end on mounted or connected to the engine through a flexible coupling. The alternator shall have a load regulation system that shall ensure optimum utilisation of the installed power of the diesel engine at all notch positions. Each Traction Alternator shall have power output of 230 KW (approximately).

5.7.2 The Alternators offered shall be with Single Bearing, which will be self locating type ball bearings.

5.7.3 The winding of the traction alternator for both stator and rotor shall be with Class H (180°C). Insulation withstanding the dusty working conditions without deterioration of electrical and other properties. The tenderer shall give details of the insulation scheme, proposed to be used for approval by RDSO. Filters if felt necessary by the alternator manufacturer shall be provided at the alternator intake. The filter shall be of dry fire retardant type. Details shall be indicated in the tender. It is, however, preferable not to use filters. One hour rating of Traction Alternator shall be 10 percent higher of continuous rating. Field proven suitable to 8WDETC TA shall be offered by successful tenderer.

5.7.4 The alternator shall have minimum rating of 230 kW to meet the full specified traction load under the prescribed site conditions, besides capability to meet the higher starting load and sustained and momentary over loads.

**NOTE:** The tenderer shall clearly specify.

- i) The VI characteristics of the Traction Alternator in d.c. at full load.
- ii) The continuous rating near the top of the VI curve (higher voltage, low current) and near the bottom of the VI curve (higher current, low voltage) at 1800 rpm and the corresponding one hour ratings.
- iii) Overload capability as a percentage of the full load and deviations.
- iv) Short circuit capability and deviations thereof.



### 5.7.5 External cables

- 5.7.5.1 For connecting the alternator with the rest of the associated traction equipment, the thin walled e-beam cables as per RDSO approved specification No ELRS/SPEC/ELC/0019(Rev.1) with latest amendment shall be provided. However, the cable sizes and the voltage grade for the power and control cables shall be given by the manufacturer.
- 5.7.5.2 The Cables from traction alternator to power rectifier should be suitable for carrying out current of 800A (rms).
- 5.7.5.3 The location of terminal box shall be on the periphery of Traction Alternator. Suitable cutaway with a cover plate having cable entry holes with suitable cable glands/ grommets to permit entry of insulated cables as selected above, shall be provided. The internal and external cable terminations shall be on a terminal board made of fiber glass SMC or better material, suitably mounted inside the alternator terminal box. The galvanized/ cadmium coated MS terminal studs of adequate size shall be located across each other without criss-crossing and they shall be suitable for crimped terminations connected palm to palm. The head of the terminal studs (preferably hexagonal) shall be embedded on the rear side of the terminal board and shall be further secured on top by a nut. For securing cable lugs, nuts, locknuts, flat and spring washers shall be provided. Adequate number of crimping sockets suitable for recommended size and number of output cables shall be supplied along with the alternator. The Crimping sockets shall be of Dowell's make only.

**NOTE:** The Terminal box location, internal and overall arrangement and dimensions shall have prior approval of RDSO.

- 5.7.5.4 The alternator housing shall be of fabricated steel construction designed to withstand high torsional stresses, shocks and vibrations. The minimum ground clearance in half worn wheel wear condition under tare weight shall not be less than 230 mm.
- 5.7.5.5 The provisions shall be made for driving the auxiliary alternator and Air Compressor through a common shaft extension from Diesel Engine through V-Belts and pulley on the extended shaft of the Diesel Engine. Pulley of C-section to IS: 3142 shall have a suitable PCD to be approved during design approval stage. The material of pulley shall steel forged conforming to IS: 2004 Gr.III. The pulley shall be push-fit with suitable securing arrangement.

### 5.7.6 TESTS:

- 5.7.6.1 Type, routine and acceptance tests on the alternator if required, shall be performed in accordance with IEC 60-349.

5.7.6.2 The type test procedure for prototype power pack (engine plus alternator) testing shall be submitted and got approved from RDSO. Type testing of prototype power pack shall be carried out in the presence of RDSO's representative. If already type testing is done for the power pack, routine/acceptance tests shall be done in the presence of RDSO's representative after getting the procedure approved from RDSO by the contractor.

**NOTE:-**

- (i) The temperature rise for the windings allowed by IEC:60-349 shall be reduced by 30 °C to allow for higher ambient temperatures.
- (ii) The characteristics curves as applicable to the traction alternator shall be submitted, duly indicating therein, the selected locations corresponding to the different notch positions.
- (iii) The successful Tenderer shall submit the bearing life and shaft calculations and get them approved before offering the alternator for inspection.
- (iv) The Tenderer shall clearly indicate the rating, weight, current, voltage and power and also dimensional details.
- (v) The excitation system adopted shall be explained in detail giving all relevant characteristics for different notch positions of the engine and their matching with engine characteristics.
- (vi) The detailed calculations for arriving at the alternator rating to meet the specified requirements shall be furnished.
- (vii) Any special item (for e.g. Screened cables) required for any signal/ control feed between engine, alternator and electronic governor shall be in the scope of supply.

5.7.6.3 **Auxiliary Drive:** An auxiliary drive of adequate capacity shall be provided to meet all the auxiliary loads of DETC. The drive shall be suitable for minimum of 8 kW auxiliary alternator.

5.7.6.4 **Power Rectifier:** Each alternator power output shall be rectified by a full wave 3 phase silicon diode bridge rectifier (two rectifiers per Intelligent OHE recording car). The rectifiers shall be suitable for under slung forced cooled and well protected. In case there is a space constraint in fitting under slung rectifier, the same shall be provided on board and this aspect shall be decided at design approval stage. The technical constructional requirements along with testing as given in Annexure-5 shall be complied with. The output of bridge shall be connected to suitable filter chock if considered necessary. The design should adequately to take care of the service conditions of the Traction Motors.

5.7.6.5 Power Rectifier should have power loss not more than 400 Watt. It should be able to work in N-1 condition. This indication "Rectifier fuse blown off" should be available on driver desk.

5.7.6.6 The OGA drawings shall be got approved prior to manufacture and supply against each contract.

## 5.8 TRACTION MOTOR

5.8.1 Four axle hung, nose suspended and self-ventilated DC series Traction Motors of proven design and approved by RDSO two on each Bogie, shall be provided on the OHE car. The Armature coils shall be formed of polyimide (kapton) covered copper conductors and suitably impregnated. TIG/MIG welding shall be used for the commutator. The technical/ constructional requirements as given in Annexure – 6 shall be complied with the traction motor of similar design and construction with proven performance in traction application on IR will be preferred. Traction motors shall be 4601 BX type of M/s. BHEL or TM 2141 A of M/s CGL type or similar proven design with taper roller suspension bearings. Class of insulation of TM shall be "H class" (180 °C Class). Output of each Traction Motor shall be 115 KW (Approximately).

5.8.2 **Motor rating:** The one hour rating of traction motor shall be of 97% excitation and continuous rating shall be adequate to give the required performance. The motor will be provided with 3% permanent ohmic field shunting.

5.8.3 The temperature rise for the windings allowed by IEC-60349 shall be reduced by 30°C to allow for higher ambient temperatures.

5.8.4 **Motor Suspension & Axle Drive:** The Traction Motor shall be nose suspended with taper roller bearing arrangement. Each traction motor shall drive one axle of its motor bogie through a single reduction gear drive enclosed in a rigid and water tight gear case firmly secured to prevent damage by movement and vibration under the most severe operating condition but easily removable for attention to the gear.

5.8.5 The Traction Motor shall be designed to comply with the operating requirements stipulated in chapter-II without exceeding the temperature rise limit.

5.8.6 The lubricants to be used for the suspension bearings and the gear case shall be specified by the manufacturer.

5.8.7 The gear wheels and pinion shall be as per RDSO's Specification No. C-K-303 with latest revision.

5.8.8 The single reduction gear with gear ratio 20:91 shall be provided.

5.8.9 The traction motor should be a complete assembly including gears, pinions, gear case, nose suspension rubber sandwich, taper roller suspension bearings, dust guard and axle shield, earth brush etc. Adequate length of the Traction Motor cables shall be brought out from the motor for termination in the under frame mounted cable connection box with provision for connecting the cables from the coach. Provision of a well covered terminal box on the traction motor such that the connection between the traction motors and the junction box is made through separate cables shall be preferred. The design of suspension shall ensure no leakage or ingress of gear case compound in the roller bearing under any circumstances.

#### **5.8.10 Motor Contactor**

Motor contactor of BHEL make or similar proven make, duly type tested and approved by RDSO/ICF/CLW, one contactor for each motor, suitable for operation in combination with overload relays, for opening the traction motor circuit in overload and under fault conditions shall be provided. These contactors shall be located in dust-proof cubicle mounted on the underframe in such a way as to prevent all risk and damage to other apparatus from arcs formed by their operation.

5.8.11 Traction motor contactors, reversers, protective relays and other control gears shall be as specified in Annexure-6 They shall be housed in box and dust proof enclosures to be mounted in the underframe, however, alternate location may also be considered subject to clearance of the offered layout by RDSO.

5.8.12 The Motor contactor shall open the circuit, they protect automatically on overload and shall be capable of clearing the resultant arcs under all conditions of overload.

5.8.13 Bearings: The Armature shall be mounted on anti-friction roller bearing of RDSO approved make. The inner race shall have adequate interference for the duty.

5.8.14 All motor contactor on OHE car shall be suitable for remote operation from any driving cab through the traction motor overload 'reset' switch. The motor contactors shall be of electro-pneumatic type of RDSO/ICF/CLW approved make or similar proven make duly type tested and approved by RDSO/ICF/CLW shall be provided with blow out coils and arcing horns, etc to brake the current without detriment to their working parts or adjacent equipment. All contact trip, interlocks, pins and plungers etc. shall be easily accessible for maintenance.

5.8.15 The Tenderer shall submit the following characteristic and performance curves:

- i) Speed Vs Tractive Effort
- ii) Current Vs Speed
- iii) Tractive Effort Vs Current

- 5.8.16 Suspension Bearing: taper roller suspension Bearings from RDSO's approved source shall be provided. Material composition and properties of plain sleeve bearings shall be as laid down in RDSO's Drawing No. RDSO/PE/SK/EMU/0052-2003 Rev.0.
- 5.8.17 First four (04) Traction Motors of first prototype 8 wheeler DETC shall be type tested by RDSO accordance with IEC-60349. Routine and acceptance tests if required on the traction motors, shall also be performed in accordance with IEC-60349.
- 5.8.18 The Traction Motor's thermal capability shall be adequate to meet the operational requirement of lowest road speed (i.e. 5 kmph) for 90 minutes. A special test shall be carried out at the time of type test to establish/confirm this aspect. For this purpose, at an output equal to one fourth of the calculated power required for the lowest road speed and the corresponding cooling available, the temperature rise shall not exceed the limit prescribed above.

## **5.9 AUXILIARY ALTERNATOR WITH RECTIFIER-REGULATOR**

Two auxiliary self-cooled, brushless pulley driven alternators of RDSO's approved make, one with each engine shall be provided in the inspection OHE Car with suitable regulating equipment and Battery Charger to supply 122 V d.c.  $\pm$  5% regulated voltage from idle speed to max. Speed of the engine for meeting the following loads:-

- i. Battery charging (110 volts, 120 Ah batteries) provided on the OHE car- 10 amps.
  - ii. Lights and fans load of the OHE Car-25 amps.
  - iii. Flood Lights
  - iv. Search lights
  - v. Control system 10 amps.
  - vi. Twin beam head light of 250 watts, 110 V d.c. as specified in Chapter-IV of this specification.
  - vii. Power required for forced cooling motor for rectifier shall be of 1 kW approximately.
  - viii. Cab Heater load one each of 1 kW in both the cab.
  - ix. The alternator shall have a rating of minimum 8 kW (Electrical load requirement shall be got approved from RDSO)
- 5.9.1 The insulation of the alternator shall be class "F" or better and the same shall not be affected by the Engine area environment, which may have traces of Diesel and Lube oil fumes.

5.9.2 **Mounting:** Suitable base frame and mounting arrangement shall be supplied alongwith the auxiliary alternator. The base frame shall have suitable belt tensioning provision. The base frame drawing shall be got approved by RDSO before manufacture. Driving and driven pulley dimensions, pulley groove details, material specification, box dimensions etc. Shall be furnished in a drawing and got approved.

**NOTE:** Alternatively, companion alternator made as an integral part of the main alternator may also be offered.

### **5.10 Rectifier-Regulator:**

5.10.1 The rectifier-regulating equipment will be under frame mounted. The crimping sockets shall be of Dowell's make only. The rectifier regulator box shall have an openable front cover, which shall be capable of being closed and locked in position by suitable hinged bolts of M12 size and wing nuts.

5.10.2 The Rectifier-Regulator box shall be of protection level IP: 65 (Completely protected against dust and jet of water from all directions).

5.10.3 The Rectifier-Regulator box shall be Electro-galvanised and painted gray.

5.10.4 The Regulator shall have provision of potentiometers for current and voltage setting for adjustment depending upon the service conditions.

5.10.5 The overall efficiency of the alternator alongwith its Rectifier-Regulator shall not be less than 70%.

5.10.6 The Rectifier-Regulator shall conform to IEC: 60-571.

5.10.7 Details of the equipment shall be as per Annexure- 5.

### **5.11 TESTING:**

The following tests shall constitute type tests which are to be carried out at the manufacturer's works to ensure compliance of the specifications.

#### **5.11.1 Type Test:**

- i. Verification of dimensions of assemblies of alternator, rectifier and regulating equipment.
- ii. Temperature rise test at minimum speed for full output as well as the maximum speed without Air over the auxiliary Alternator and the rectifier regulator box.
- iii. Insulation resistance test.
- iv. High voltage test
- v. Load test
- vi. Mechanical over speed and induced voltage test.
- vii. Drooping voltage characteristics test.
- viii. Current limiting characteristics test.
- ix. Surge protection test.

- x. Measurement of stator and field resistance.
- xi. Water tightness test for rectifier – regulator.

5.11.2 **ROUTINE TESTS:** All tests other than those indicated at serial nos. ii, vii and ix of type tests mentioned above, shall be OHE carried out.

5.12 **CONTROL AND INSTRUMENTATION:** The basic control scheme shall ensure matching of traction load with that of the diesel engine output preventing any overloading. The two power packs will independently feed two motors each (the motors fed from one power pack being on the same bogie). In case of failure of one power pack, it shall be possible to isolate the same, on line, by the driver, and the OHE car shall continue to be worked with the healthy power pack, at reduced power.

5.12.1 Motor speed will be controlled by varying the applied voltage. The two Traction Motors fed from one power pack shall be connected in parallel.

5.12.2 The tenderer shall furnish, along with schematic circuit diagrams, the power, auxiliary and control scheme proposed to be followed.

5.13 **Traction Control Gear:** General Design Consideration: Control gear for the motors and other switch gear shall comply with IEC:60-77 and shall be suitable for 110V D.C. supply.

5.13.1 The winding of all magnet coils shall be properly dried, impregnated, baked and moulded with epoxy resins.

5.13.2 All auxiliary machines operated on 110V D.C. supply shall be provided with adequately rated dc contactors.

5.13.3 All the contactors used for breaking dc current of value 10 A and above shall have properly designed arc chutes and blow out coils.

5.13.4 DC contactors shall be operated for one million operation during endurance test for an electrical endurance capability of 1 million operations at the rated voltage and current.

5.14 **SCOPE OF CONTROL GEARS:** Control gears which are in the scope of supply of the contractor shall comprise of all apparatus and connections necessary for the safe and efficient operation of the equipment and shall include the following.

5.14.1 The Control Gears shall include:

- i) Driver Desk
- ii) Control Cubicle-1
- iii) Control Cubicle-2

- iv) Motor Switch group cubicle
  - v) Resistor Panel
- 5.14.2 Energizing and controlling Traction Alternator and main motor circuits and protecting these circuits from overload or short circuits.
- 5.14.3 Operating traction motor contactors, reversers, etc. By means of low voltage control circuits through any master controller and automatically regulating the same as required for operation.
- 5.14.4 Providing means for annunciation of different healthy and fault conditions, through necessary auxiliary contacts and LED indication lamps, for traction and brake circuits at the driving cab.
- 5.14.5 Providing low tension supply of the main lighting circuits, ventilation equipments, charging the 120 Ah, 110 V battery and driving of the auxiliary machines.
- 5.14.6 Earthing in an approved manner, all equipment boxes and cases supporting or containing live parts and of the main traction motor and auxiliary machine circuits.
- 5.14.7 Protecting and isolating all auxiliary circuits by means of circuit breakers and by manually operated isolating switches or links and fuses.

## **5.15 CONTACTOR BOX(S)**

- 5.15.1 All the power contactors of a power pack shall be housed and interconnected through bus bar in a separate cubicle called "CONTACTOR BOX", which shall preferably be under slung however, alternate location may also be considered subject to clearance of the offered layout by RDSO and designed for IP-55 (hose proof) protection. For each OHE car, two such boxes shall be supplied (one per power pack).
- 5.15.2 **REVERSER:** Electro pneumatically operated reverser of proven design of reputed make duly tested and approved by RDSO/ICF/CLW for changing the direction of rotation shall be provided in each motor circuit. These shall be mounted in cubicle on the underframe and shall be of robust design, remote controlled and suitably interlocked to ensure that no movement can take place while they carry current. Provision shall be made for hand operation, in emergency. The reverser contact shall have self-wiping action.
- 5.15.3 Mounting arrangement shall be finalized at design approval stage.
- 5.15.4 **Motor Cut out Switch:** Two four position rotary switches, of RDSO/ICF/CLW approved make one for motor 1&3 and other for motor 2 & 4 shall be provided. The first switch will have position marked as 'normal', '1 out', '1 & 3 out' and '3 out'. The second switch shall have



markings 'normal', '2 out', '2 and 4 out' and '4 out'. The switches shall have sufficient contacts to provide various facilities for control as required including the following.

- (i) To energise the shunt coils of the current limit Relay to reduce the drop out power current value suitably, if any motor is cut out.
- (ii) To prevent operation of 'motor switches trip' lights when motor have been deliberately cut out.
- (iii) To permit operation of the unit while CABR is tripped provided that a pair of motors has been cut out.
- (iv) To control feeds to the individual motor contactors, to isolate the contactors and cut the motors out of the circuit.
- (v) All pneumatic equipments used in the power circuit shall be able to perform satisfactorily at minimum pressure of 5.0 kg/cm<sup>2</sup>.

#### **5.15.5 RELAY PANEL:**

##### **5.15.6 Alternators:**

Earth fault relay – for earth faults in the traction circuit.

##### **5.15.7 Traction motor:**

- (i) Overload relay/ over current protection-resetting type with reset in the Driver's cab -Contactor Box
- (ii) Earth fault relay -Control Panel-1
- (iii) Scheme for isolation of faulty motor: A scheme of isolation shall be provided individually for all the four traction motors to facilitate their isolation by the driver quickly. -Control Panel-1

5.15.8 All the control relays required for the system shall be supplied duly mounted on a panel, name-tagged, wired and properly terminated.

#### **5.15.9 INSTRUMENTS AND SAFETY DEVICES:**

**5.15.9.1** The following instruments & safety devices shall be part of supply for safe and satisfactory operation of the OHE car. The equipment and controls shall be arranged in both the driving cabs of the OHE car so that the OHE car can be worked from any one of the driving cabs. Interlocks shall be provided such that OHE car can be operated from one cab only at a time. The driver should be able to start or shut down the engine from his cab.

##### **5.15.9.2 Instruments:**

##### **5.15.9.3 Diesel Engines.**

##### **5.15.9.4 Switches, meters and gauges**

- (i) Engine starting switch/ push buttons
- (ii) Lube oil pressure gauges
- (iii) Lube oil temperature gauges
- (iv) Cooling water temperature gauges

- (v) Battery charge/ discharge ammeter for 24 V battery.
- (vi) Engine hour meter and engine speed indicators
- (vii) Engine stop switch/push buttons
- (viii) Low cooling water level indicators
- (ix) Over speed devices
- (x) Emergency stop for engine by Borden wire

#### **5.16 Safety Devices:**

- a) Water temperature too high- engine to idle. However, driver shall be able to raise the engine speed during the operation of the hot water temperature switch.
- b) Low lube oil pressure - engine to shut down
- c) Engine over speed - engine to shut down
- d) Radiator water level low - engine to shut down
- e) Low Hydraulic oil level - engine to shut down

#### **A. Traction Alternator:**

- a) Control battery (110 V) Voltmeters.
- b) Control battery (110 V) Ammeter
- c) For protecting the source, earth fault relay shall be provided.
- d) Earth fault relay – for earth faults in the traction circuit

#### **B. Rectifiers:**

- a) Traction Ammeter - To indicate the current drawn from rectifiers.
- b) Voltmeters reading phase to phase voltage

#### **C. Traction motor:**

- (i) Overload relay/ over current protection-resetting type with reset in the Driver's cab.
- (ii) Earth fault relay.
- (iii) Scheme for isolation of faulty motor: A scheme of isolation shall be provided individually for all the four traction motors to facilitate their isolation by the driver quickly.

**NOTE:** Recommended settings for all the aforementioned relays shall be specified by the tenderer.

**5.17 Control and Auxiliary Circuits:** All circuits shall be protected by MCBs of appropriate ratings and type. Ratings of the MCBs to be provided shall be furnished by the tenderer.

**5.17.1** All coils of contactors and relays shall be provided with suitably rated freewheeling diodes.

## 5.18 DRIVER'S CONTROL DESK.

5.18.1 The Driver's Desk complete in all respect with all the control gear items duly fitted, wired and terminated on a terminal board shall form the scope of supply of contractor.

5.18.2 **DRIVER'S CONTROL SWITCH:** The driver's control circuit shall be energized through the driver's control key. The interchangeability provided shall be such that the key can be removed from the lock only when the switch is turned to off position and when the key has been removed, the switch cannot be turned to the ON position. The key shall be common for both drivers' key switches.

### 5.18.3 MASTER CONTROLLER :

- i) The number and arrangement of step shall be marked on the master controller.
- ii) Contacts and operating mechanism shall be easily accessible and of suitable design for railway service. All live portions and contacts, cables and terminal mountings within the master controller shall be kept well clear of exhaust from all pipe unions to, any pneumatic equipment.
- iii) The reversing drum operating boss shall be fenced in such a manner that the key can only be inserted and withdrawn when the drum is in the neutral/off position and the drum shall be mechanically interlocked so that it can only be placed in this position when the master controller handle is in the OFF position.
- iv) The master controller shall be fitted with a Dead Man's handle (depression type) designed to switch OFF power and apply brakes automatically whenever the driver releases his pressure on the handle, if it is in any but the OFF position and in the OFF position if the reverser key is in FORWARD or REVERSE positions. The Dead Man's handle mechanism shall be suitably enclosed to prevent interference with it or the insertion of any form of packing to wedge the handle down.
- v) Spare contacts provided to be paralleled to prevent the tower wagon from not responding in case of any bad contacts on any of the interlocks.

### 5.19 INDICATION LIGHTS :

5.19.1 The indications of LED type shall be provided in both driving cabs of the OHE Car as given in Clause – 5.20. Built in redundancy (with spare LED) should be there so that in case of failure of one LED the indication is available.

5.19.2 The "LED" indication provided in the OHE Car shall have illumination level of minimum 30 mcd High intensity type LED, capable of being seen even against Direct Sunlight. The arrangement of LED indication panel with LEDs connected with series resistor is NOT preferred.

5.19.3 The Driver's desk shall be fabricated preferably in single unit, however two parts can be considered at the time design drawing approval for ease of loading.

## **5.20 CONTROL PANEL**

**5.20.1** A suitably designed control panel shall be provided in the OHE car for housing all the control accessories. The panel shall be so situated so as to provide easy access to all the components for their maintenance /service.

**5.20.2** Adequate Control Equipment including gauges, instruments and cab safety devices shall be provided for safe and satisfactory operation of the DETC. The controls shall be so arranged in the driver's cab that it will be within easy reach of the driver from all drivers' position. All gauges shall be of proven, reliable design and of LED lit type. Gradations of all gauges shall be in metric unit. Following gauges shall be provided in the cab:-

- i) Diesel Engine lube oil pressure gauge.
- ii) Cooling water temperature gauge (Electronic)
- iii) Traction Motor load ammeter.
- iv) Air brake gauges.
- v) Battery charge and discharge ammeter.
- vi) Water level indicator (Electronic)
- vii) Speedo Meter.

The following audio-visual signals or reference panel lights shall be provided in the cab for operation of the inspection OHE Car:

- i) Low lubricating oil pressure
- ii) Lube oil temperature too high
- iii) Radiator water temperature too high
- iv) Engine 1 ON
- v) Engine 2 ON
- vi) Engine shut-down
- vii) Wheel slip indication
- viii) Battery discharge indication
- ix) Aux Gen failure indication
- x) Low idle rpm indication
- xi) Power ground
- xii) Cranking contactor welding indication
- xiii) Traction control supply ON
- xiv) Alternator 1 Excitation ON
- xv) Alternator 2 Excitation ON

- xvi) Alternator overload
- xvii) Alternator winding temp
- xviii) Alternator bearing temp
- xix) Engine 1 Trip
- xx) Engine 2 Trip
- xxi) Rectifier 1 fuse failure
- xxii) Rectifier 2 fuse failure
- xxiii) Rectifier 1 fan failure
- xxiv) Rectifier 2 fan failure
- xxv) Aux . Alternator failure.
- xxvi) Motor over load.
- xxvii) Motor Earth fault.
- xxviii) Parking Brake applied.
- xxix) Emergency Brake applied
- xxx) Drive function released.
- xxxi) Common annunciation.

The following safety devices, inter alia, shall be provided:

- i) Water temperature too high - Transmission cut off and engine returned to idle.
- ii) Low water in radiator-Power to transmission cut-off and engine shut down.
- iii) Low lube oil pressure- Power to transmission cut-off and engine shut down.
- iv) Engine speed too high (over speed trip)- Power to transmission cut-off and engine shut down  
Adequate protection of an approved design shall be provided against electrical over loads and grounding.

#### **5.21 Surge suppression capacitors:**

Capacitors of suitable rating shall be wired in the control circuits to reduce the arcing at contacts of the relays to a minimum.

#### **5.22 Operating Keys and Locks :**

One set of operating keys of the approved design and dimensions having the following function shall be provided with each unit:-

- (i) Door lock key.
- (ii) Driver's control Switch key.
- (iii) Master controller locking key, (Reverser key)
- (iv) Any other control key offered as necessary.
- (v) Brake controller key.

**Chapter – VI****MISCELLANEOUS:****6.0 Tools**

**6.1** Each OHE Car shall be supplied with a complete kit of tools and testing equipment required by a driver in an emergency and for normal working of the OHE Car. These will be arranged in a tool box provided in a cab. These tools are listed in annexure 8-A & 8-B.

**6.2** A list of tools to be provided for use in Maintenance Depot shall include tools necessary for maintenance and repair of the entire OHE car including specified equipment for auxiliary and ancillary equipment. The tenderer should list and quote for these tools. The rate shall however not be used for tender evaluation purpose. It shall not be mandatory for railways to buy these tools.

**6.3** All special tools shall be listed and catalogued illustrating the method of application.

**6.4** Maker's test certificate -Copies of maker's test certificates guaranteeing the performance of the equipment/accessories shall be supplied in duplicate alongwith the delivery of each OHE Car.

**6.5 Weighment:**

**6.5.1** Each completed OHE car shall be weighed 4 times successively and vertical load exerted by each wheel on the track shall be measured, with due regard as to the accuracy of the measuring equipment. The pre-weighment run shall be over a section of track containing difference of levels. No alteration or adjustment shall be made to the OHE car after passing or adjustment shall be made to the OHE car after passing over this section of track and before weighment. The arithmetic mean of the values taken during 4 successive weighment shall be the value of measurements.

**6.5.2** After weighment, a check shall be made to ensure the following:

- i) Total weight is within the nominal weight.
- ii) Axle load is within +/- 2 % of the nominal axle load.
- iii) The difference between the two wheel loads of any axle is not more than 4% of the axle load. First completed prototype OHE car shall be subjected to squeeze test to ensure that it shall withstand a maximum end load of 200 t without any signs or permanent distortion. The test conditions is specified in Clause-3.1.1.

**Chapter-VII****INSPECTION**

- 7.1 The whole of the materials or fittings used for works covered by this specification shall be subjected for inspection by the Inspecting officer to be nominated by the purchaser and shall be to his entire satisfaction.
- 7.2 The Inspecting officer shall have the power to: -
- a. Adopt any means he may think advisable to satisfy himself that the materials for fittings specified are actually used throughout the construction.
  - b. Take samples for such tests as he may consider necessary by an approved Metallurgist selected by him, whose report shall be final and binding on the contractors.
  - c. Visit at any reasonable time and without previous notice the contractor's works to inspect the progress and quality of the work and the contractor shall provide free of charge all equipment and labour required by him for this purpose.
  - d. Reject any material or fittings that do not conform to the relevant specification or good practice, which shall be marked in a distinguishable manner, and shall be disposed off in such a manner as the Inspecting Officer directs. Such rejected parts shall be replaced by the contractor without extra charge.
- 7.3 Tests of materials and fittings shall as far as possible be OHE carried out at the works of the maker's of the materials or fittings. The contractor shall provide such additional materials or fittings as may be required or arrange for test pieces to be incorporated in forgings and castings as required by the Inspecting Officer and for their removal in his presence for test purposes. All tests in the works of the contractors and their sub-Contractors shall be at the cost of the contractors.
- 7.4 No material shall be dispatched or packed until it has been passed by the Inspecting Officer. Such passing shall in no way exonerate the contractor from their obligation in respect of quality and performance of the OHE car.
- 7.5 In the event of dispute between the Inspecting Officer and the Contractor, the decision of the purchaser shall be final and binding.
- 7.6 **Radiographic testing of steel castings.**
- 7.6.1 All steel castings wherever used and welding joints shall be subjected to radiographic testing after manufacture / repair, to a suitable scheme/ standard suggested/approved by RDSO.

7.7 One of the power bogies shall be subjected to exhaustive stationary tests at Contractor's works in the presence of RDSO representative. The tests on bogies shall include dynamic fatigue testing and strain measurement. The test shall be under simulated loading conditions to represent the service load. The body shell shall also be subjected to loads for validating the design calculations of shell. The contractor shall afford all facilities for conducting these tests at his cost.

7.8 **Acceptance tests.**

Besides the checking and testing OHE carried out during manufacture and before dispatch of the OHE car to India it shall be subjected to the following tests before final acceptance.

7.8.1 **Performance capability tests.**

The OHE car shall be subjected to tests to establish its performance based on the supply by the tenderer against the specification. The contractor shall at his own expense provide the services of competent Engineers/Supervisors and supporting staff during the performance capability tests of the prototype.

7.8.2 **Riding quality tests.**

The riding quality tests shall be based on detailed oscillation trial conducted at a speed 10% higher than the maximum specified operating speed on a section of mainline track conforming to test stretch as mentioned in 3<sup>rd</sup> criteria committee report to establish the performance at the specified maximum operating speed.

7.8.3 Emergency Braking Distance (EBD) and haulage capability Test shall be conducted.

7.8.4 The following shall be the track standards of the test section:

(i) **Track structure:**

The track shall be to a minimum standard of 90 R rail on sleepers with M+ 4 densities and minimum depth of ballast cushion below sleeper of 200 mm, which may consists of at least of 75 mm clean and the rest in caked up condition on compact and stable formation. However speed will depend on the axle load, Axle spacing, dynamic augment value the rolling stock etc.

(ii) **Permitted irregularities:**

The track is maintained as per Indian Permanent Way Manual and para 607 (i) gives details of track category for various parameters. Third report of criteria committee shall be considered for number of peaks per kilometer, if specified any.



**ANNEXURE - 1**

## LIST OF EXHIBITED DRAWINGS

| Sl.No | Drawing No.   | Description                                     | Clause Ref. |
|-------|---|---|-------------|
| 1.    | Diagram ID 1676 mm gauge (BG) of IR schedule of dimension                   | Maximum moving dimension.                       | 2.2.6       |
| 2.    | RDSO/SK.No.99003  | Draw gear arrangement                           | 3.8.4       |
| 3.    | RDSO/SK.No.98145  | Side buffer arrangement                         | 3.8.4       |
| 4.    | RDSO/SK.No.99001  | Screw coupling assembly.                        | 3.8.4       |
| 5.    | C/BF/113  | Tail lamp bracket.                              | 3.14 (iii)  |
| 6.    | W/WL-1660   | Wheel   | 3.21.2      |
| 7.    | RDSO STR No.56-BD-07  | For CBC   | 3.19        |
| 8.    | ICF Drg No WL.RRM4-7-3-401 with latest alteration                           | Roof Ventilators                                | 3.2.3       |
| 9.    | ICF Drawing No ICF Drawing No.AC/EMU /M/ASR-0-0-001 with latest Alteration. | Bogie design                                    | 3.6.2       |
| 10.   | RDSO Drawing No. SK-K4004   | Wheels  | 3.7.2       |
| 11.   | ICF Drawing No. EMU/M-3-2-064 (Latest)                                      | Brake Rigging                                   | 3.8.2       |
| 12.   | ICF EMU/4C/ASR-5-4-402 with latest alteration                               | Lift type window made of powder coated aluminum | 3.3         |
| 13.   | RCF Drawing No.EM.26108 (Latest)  | Cattle Guard                                    | 3.15        |
| 14.   | ICF Drawing No. EMU/M.ASR-41-001 with latest alteration.                    | Flooring construction of the vehicle            | 3.13        |
| 15.   | RDSO sketch No 91146 with latest alteration                                 | The wheel profile.                              | 3.7.4       |
| 16.   | RDSO's approved source  | Tapper Roller Suspension Bearing                | 5.8.16      |

**ANNEXURE - 2****List of Drawings/calculations to be submitted to RDSO for approval before undertaking manufacture of prototype inspection OHE car**

| <b>Sl.N.</b> | <b>Drawing/Documents to be submitted to RDSO for approval</b>  |
|--------------|--|
| 1            | Layout of OHE car  |
| 2            | Suspension arrangement.  |
| 3            | Helical coil spring  |
| 4            | Load vs deflection diagram of helical coil spring  |
| 5            | Suspension calculation   |
| 6            | Enlarged View of Driver's window   |
| 7            | Normal Visibility diagram of Driver  |
| 8            | Cooling circuit diagram  |
| 9            | Axle Box Guide arrangement   |
| 10           | Brake rigging assembly   |
| 11           | Schematic Diagram of Brake system  |
| 12           | Braking effort and Emergency Braking Distance calculation on plane section with maximum load and without load. |
| 13           | Wheel and axle (non powered)   |
| 14           | Wheel Diameter 952 (machined)  |
| 15           | Shell arrangement  |
| 16           | Side wall assembly ( Right)  |
| 17           | End wall (Right)   |
| 18           | Roof Assembly  |
| 19           | Transverse cross section   |
| 20           | Vogel Diagram  |
| 21           | Alignment of OHE car   |
| 22           | Power pack arrangement   |
| 23           | Under frame arrangement  |
| 24           | Trammeling diagram   |
| 25           | OHE Car lifting arrangement  |
| 26           | Details of weight transfer calculation.  |
| 27           | Loading Diagram  |
| 28           | Roof Equipment layout  |
| 29           | Estimated weight of the OHE Car structure and weight of principal assembly mounted on the OHE Car              |
| 30           | FEM calculation of body shell and bogie.   |
| 31           | Un sprung mass OHE car   |
| 32           | Calculation of centre gravity from rail level and Balancing calculation under tare and loaded condition.       |
| 33           | Power pack arrangement   |
| 34           | Axle (powered)/ Motorised Bogie.   |
| 35           | Axle drive Gear box assembly   |
| 36           | Fuel Tank  |

|    |   |
|----|---|
| 37 | Enlarged view of drivers window   |
| 38 | Ant pilferage measure   |
| 39 | Checking of squareness of door and end wall   |
| 40 | Measurement of deflection of underframe.  |
| 41 | Measurement of distortions of doorways along the length of OHE car                                      |
| 42 | Measurement of distortions of shell across width at door way  |
| 43 | Drawing showing location of strain gauges on the under frame.   |
| 44 | Speed v/s Tractive Effort characteristics of OHE Car  |
| 45 | The block diagram showing power circuit.  |
| 46 | Calculation for safety against derailment. Calculation for stability of the OHE car against wind force. |
| 47 | Details of weight transfer calculation.   |
| 48 | Electrical wiring diagram for electrical gadgets.   |

**ANNEXURE-3**

The following details pertaining to electrical equipment shall be submitted by the tenderer :

- I. Diesel Engine
  1. Exact description and model of the engine
  2. Rated output under UIC site conditions
  3. Site Conditions
    - Ambient Temperature 55 °C
    - Altitude above mean sea level 1000 m
    - Relative humidity above 40%
  4. Rated speed at continuous rating
  5. Type of cycle (two/four stroke)
  6. Method of pressure charging
    - Pressure ratio of compressor at the rated output
    - Single stage/two stage
    - No. of turbochargers used
    - Make and model of turbocharger
  7. Type of exhaust system
    - Constant pressure/pulse type/multi pulse type
  8. Method of cooling the charge air
  9. Type of combustion chamber
  10. Fuel injection equipment
    - Type of injection system
    - Diameter of pump plunger
    - Nozzle opening pressure
    - Maximum duration of injection in degrees of crank
  11. Number, arrangement and angle of cylinder.
  12. Cylinder bore
  13. Piston stroke
  14. Cubic capacity/cylinder
  15. Compression ratio
  16. Firing order
  17. Mean piston speed at rated speed
  18. Brake mean effective pressure
  19. Maximum combustion pressure at no load at minimum idling speed
  20. Compression pressure at rated output
  21. Minimum no-load idling speed – whether a low idle feature is provided on the engine
  22. Minimum no load speed under steady conditions
  23. Speed ranges which should not be used continuously
  24. Break away torque when the cooling water temperature is 5 °C

25. Minimum firing speed when the cooling water temperature is 5<sup>0</sup>C or at the lowest possible temperature of air intake air in rev/minute.
26. Torque resistance to the firing speed required to turn the engine when the cooling water temperature is 5 <sup>0</sup>C at the lowest temperature of intake air.
27. Piston
  - i.Type of Piston used – whether single piece or composite
  - ii.No. of piston rings used.
  - iii. configuration of the rings
  - iv. whether all the rings are located above the gudgeon pin
  - v.method of cooling required for the piston
  - vi.oil flow rate and temperature of oil at the piston outlet
28. Cooling system
  - i.Single/double cooling circuit
  - ii.Whether cooling system is pressurized
  - iii.Coolant temperature at outlet from the engine
  - iv.Heat absorbed by the cooling water at the rated output
  - v.Rate of flow of water
  - vi.Inter cooler coolant temperature at entry to the cooler
  - vii.Treatment recommended for water
29. Lube Oil System
  - i.Temperature of cooling oil with the indication of the point of measurement
  - ii.Maximum permissible temperature of cooling oil
  - iii.Heat absorbed by the cooling oil at rated output
  - iv.Swamp capacity
  - v.Quantity required to commission
  - vi.Brand of oil recommended
30. Consumption of lubricating oil at the rated output in litres/hour and as a percentage of fuel consumption.
31. Total capacity of lubricating oil pump (s) at the rated output speed in litres/min
32. Lubricating oil pressure at rated speed on entering the engine and at the normal operating temperature
33. Maximum pressure of charge air in the intake manifold at the rated output.
34. Maximum pressure of gases at the turbo inlet at the rated output
35. Maximum speed of the turbocharger at rated output
36. Maximum permissible speed of the turbocharger.
37. Temperature of exhaust gases at turbo inlet at the rated output under UIC and site conditions.
38. Maximum permissible temperature for which the turbocharger components have been designed
39. Heat balance of the engine
40. Weight of the engine complete with all items excluding water and lubricating oil.
41. Weight of water contained in the engine

42. Weight of oil contained in the engine
43. Weight of major components to be handled during maintenance
  - i. Turbocharger
  - ii. Inlet cooler
  - iii. Crank case bare
  - iv. Crank shaft
  - v. Piston and connecting rod
  - vi. Cylinder liner
  - vii. Cylinder head
44. Specific fuel consumption with the tolerance band under UIC and site conditions – indicate the lower heating value of the fuel used in arriving at the specific fuel consumption figures
45. Fuel oil consumption at idle in litres/hour
46. Requirement of fuel specification or any other restriction on the use of fuel with different sulphur contents
47. Number of such engines used in rail traction and the period since the engines have been in service and their performance
48. Safety devices provided on the engine
  - i. Over speed
  - ii. low lube oil pressure
  - iii. overload
  - iv. high exhaust temperature
  - v. high intake temperature
  - vi. any other
49. Specification of lube oil suitable for engine
50. Method of starting
51. Governor
  - i. Make and type
  - ii. Full load speed and drop characteristics
  - iii. Torque required at the output shaft
52. Estimated period between top and major overhauls
53. periodicity of overhauling the following critical components
  - i. Turbocharger
  - ii. Piston and piston rings
  - iii. Cylinder liner
  - iv. Air and exhaust valves
  - v. Fuel pump
  - vi. Injector/Nozzle assembly
  - vii. Main bearings
  - viii. Connecting rod bearings
54. Whether the diesel engine is suitable for satisfactory sustained operation under :
  - i. Site conditions mentioned in para 2
  - ii. Dusty environment
  - iii. Frequent starting and stopping of diesel engine
  - iv. Average load factor 60%
55. Inlet and exhaust valve timings

56. Special design features of diesel engine highlighting the measures which have been taken to achieve :
- i. Low specific fuel oil consumption
  - ii. Low lubricating oil consumption
  - iii. Low idling fuel oil consumption
  - iv. High reliability
- Maximum availability
- Reduced level of thermal and mechanical loading of critical components
57. General arrangement and dimensional details.
58. Characteristic curves of diesel engine under UIC and site conditions-
- i) Curves for torque, output and specific fuel consumption expressed and guaranteed without upper tolerance for different settings of the injector pump, i.e.
    - Setting at which the engine develops the rated output at its rated speed.
    - Setting at which the engine develops  $\frac{3}{4}$  of the rated output at its rated speed.
    - Setting at which the engine develops  $\frac{1}{2}$  of the rated output at its rated speed.
    - Setting at which the engine develops  $\frac{1}{4}$  of the rated output at its rated speed.
  - ii) The torque speed curve which the manufacturer considers to be the maximum torque that should be used for rail traction. This should cover the range from idling speed to the point corresponding to the international rated output at the rated speed.
  - iii) The curve of fuel consumption for no-load running, commencing from the minimum idling speed, expressed in litre/h

**ANNEXURE -4****TRANSMISSION SYSTEM PARTICULAR****I Alternator**

1. Description Make & type
2. Drive – Details of arrangement of bearings and coupling
3. Classification – No. poles, number of phases and phase connections
4. Maximum permissible speed –  
Max. voltage a.c.  
D.C. (i.e. rectified)  
Max. current a.c..
5. Rating -
  - i) One hour rating – Voltage, current, output & speed
  - ii) Continuous rating –
    - (a) High voltage
    - (b) Low voltage
6. Class and type of insulation
  - a) Stator
  - b) Rotor
7. Temperature rise
  - a) Rotor winding
  - b) Stator winding
8. Resistance at 25 °C
  - a) Rotor winding
  - b) Stator winding
9. Synchronous impedance at max. frequency and load
10. Stator details
  - a) Overall dimensions
  - b) No. and size of slots
  - c) Winding
    - i) Type
    - ii) Conductor size and material
    - iii) Turns per coil
    - iv) Pitch
11.
  - a) Rotor-type, No. of poles, length, bore, size and air gap
  - b) Details of rotating armature exciter and rectifier assembly
12. Bearing:
  - a) Single or double
  - b) Type-sealed or open
  - c) Grease-type, capacity and time interval for regreasing
  - d) Bearing life and shaft size calculations.
13. Mountings – Details of mounting arrangement.
14. Coupling-Type and details
15. Cooling  
Calculations of cooling capacity



16. Weight
  - a) Complete unit with accessories
  - b) Alternator only
  - c) Rotor (with fan if any)
17. Characteristic curves
  - a) Natural curves
  - b) V-I curves (Notch wise)
  - c) Efficiency vs. current
18. Tests : Results of –
  - a) Type test
    - i) Temp. rise test and its calculation
    - ii) Rating
    - iii) Characteristic curves
  - b) Routine test
    - i) Temperature Rise Test
    - ii) Over speed Test
    - iii) Dielectric Test
19. Tractive Efforts vs. Road Speed curve along with Alternator Rectifier Current vs. Voltage curve showing method of calculations.

## **II** Auxiliary Alternator with Rectifier – Regulator

1. Make
2. Model
3. Continuous & short time rating and details of voltage and current regulation
4. Bearing life and shaft size calculations.
5. Weight

## **III** Traction Motor

### 1.1 Type

1. V - volts
2. I - Amps
3. N – rpm
4. S – km/h
5. N max/N
6. N shaft
7. N max

### 1.2 Armature

1. Diameter.
2. Length
3. Air ducts – surface  
- section
4. No. of slots.
5. Conductor size.

6. Conductor area.
  7. A) Continuous..... for .....amps  
1 Hour .... for..... amps
  8. Continuous ..... A/sq.mm for..... A  
1 Hour..... A/sq. mm for ..... A
  9. A) Continuous .....  
1 Hour .....
  10. ADNL  $10^{-9}$  ..... at cont FF  
..... at 1 hr rating  
..... at S max.
  11. B (B/A)..... at cont FF  
..... at 1 hr rating  
..... at S max.
  12. S max .....km/h
  13. N max.....rpm
  14. Wheel dia (half worn)
  15. Gear Ratio (New)
  16. Suspension
  17. Armature bearing – commutator end  
- pinion end
  18. Turns/coil
  19. Type of winding
  20. Coil Throw
  21. Length mean turn
  22. Resistance at 110°C
  23. Inductance at 30 cps.
  24. Weight of copper (kg)
  25. Tooth volume
  26. Core volume
  27. Arm. Turns/pole
  28. Arm. At/pole - FF
  29. Arm. Core int.dia
  30. Net core depth
  31. Arm. Steel tech. spec.
  32. Banding material
  33. No. of bands cc
  34. Band width.
  35. S (cont) ..... M/s ..... rpm .....km/h
- 1.3 Main poles
1. Insulation
  2. Number
  3. External ..... D Internal ..... D

4. Number of turns per pole.
  - Frame end
  - Arm end
5. Conductor dimension – Frame end
  - Arm. end
6. Current density
  - Frame end
  - Armature end.
7. Length of mean turn - Frame end
  - Armature End
  
8. Resistance at 110°C
9. Inductance at 50 cps
10. Radial gap length -
  - Tip
  - Centre
  - Mean
  - Eff
  
11. Field At
  - ..... @ FF
  - Arm. AT
12. Pole Arc.
13. Total fringe
14. Eff. Pole arc
15. Eff gap area
16. Pole flux density.
17. Pole copper weight.
18. Pole steel tech spec.
19. Yoke steel tech. spec.
  
- 1.4 Commutation poles
  1. Insulation
  2. Number
  3. External ..... D Internal ..... D
  4. Number of turns per pole – Frame end
    - Arm end
  5. Conductor dimensions
    - Frame end
    - Arm end
  6. Current density
    - Frame end
    - Arm end
  7. Length of mean turn
    - Frame end
    - Arm end
  8. Resistance at 110° c
  9. Inductance a t 50 cps
  10. Radial gap length
    - Tip
    - Centre
    - Mean
    - Eff

11. Int. Pole flux density
  12. Copper weight
  13. Pole steel tech. spec.
- 1.5 Equalisers (commutator end)
1. Total number
  2. Copper weight
- 1.6 Ventilation
1. Number of fans
  2. Flow .....m<sup>3</sup>/min (at continuous speed)
  3. N ..... rpm ..... N max  
(overspeed)
- 1.7 Commutator and brushes
1. Useful diameter
  2. Useful length
  3. No. Of commutator bars.
  4. Bar pitch
  5. Average bar/brush
  6. Voltage between segments
  7. Reactance voltage
  8. Insulation thickness between bars.
  9. Number of brush arms
  10. Brush/arm
  11. Brush/size
  12. Quality
  13. Current density  
For ..... Amps (cont)  
For ..... Amps (1Hr.)  
For ..... Amps (start)
  14. S (cont) ..... m/s ..... rpms
  15. S (1hr) ..... m/s .....rpms
  16. S (max ) ..... m/s ..... km/h
  17. Type of commutator construction
- 1.8 Weight
1. Motor without gearing ..... kg ..... N
  2. Armature without pinion .....kg ..... N  
CONT  
kg N kg N 1 Hr
  3. Wt/kw
  4. Wt/hp
  5. Pinion (kg)

6. Gear wheel (kg)
  7. Gear case (kg)
  8. Frame (kg)
  9. Total weight (kg)
- 1.9 Losses and Efficiency  
1 Hour Continuous
1.  $I^2 R$  (ARM)
  2.  $I^2 F$  (Series)
  3. Core
  4. Brush drop
  5. Brush friction
  6. Bearing F and W
- 1.10 Magnetic Circuit

1. 1 hr rating values

|          | <u>Magnetic</u><br>Area      length | $\frac{FF_{Leakage}}{B}$<br>AT |
|----------|-------------------------------------|--------------------------------|
| Tooth    |                                     |                                |
| Core     |                                     |                                |
| Pole     |                                     |                                |
| Yoke     |                                     |                                |
| Gap      |                                     |                                |
| Total AT |                                     |                                |

- 2.0 Gears and pinions
1. Type of gearing
  2. Module
  3. Grade of steel used for pinions and gears
  4. Particulars of heat treatment
  5. Kilometerage guarantee for bull gears
  6. Kilometerage guarantee for pinions
  7. Material and type of construction for gear case.

IV. Power Rectifier

1. Diode – Make & type
2. No. of parallel paths & no. Of diodes /path
3. Overall dimensions of rectifier unit
4. Ratings
  - a) Current Rating  
- max. Cont. (direct) forward current
  - b) Thermal Rating

- Max. & Min. Operating junction temp
- Max. & Min. Storage temperature
- 5. Resistance
  - a) Forward
  - b) Reverse
- 6. Details of damping circuit
  - a) Resistance value & circuit
  - b) Capacitance value & connection
- 7. Bus bar arrangement
- 8. Weight
- 9. Mounting arrangement
- 10. Characteristic curves
  - a) Voltage vs. Current
  - b) Power dissipation as a function of reference point temperature
- 11. Semi-conductor fuses
  - a) Make
  - b) Fusing characteristics
  - c)  $I^2 t$  characteristic

**ANNEXURE-5****POWER RECTIFIER SPECIFICATION****1.0 Technical requirements including the design features.**

**1.1** The rectifier unit shall comprise of three phase full wave bridges using silicon diodes. It shall preferably consist of three separate bridges connected in parallel on the input and output side.

**1.2 Device Rating**

1.2.1 The current rating of the devices shall be such that even under one bridge (n-1) failure condition the rectifier, with two remaining effective three phase bridges shall be capable of meeting the full Tractive power duty/duty cycles and abnormal conditions including short circuit.

1.2.2 An unbalance of 20% shall be considered in the sharing of the load between the bridges, for design purposes, though, in actual testing the unbalance shall be limited to 10% only.

1.2.3 The diodes shall have a PIV rating of not less than 3000 V or not less than 2.8 times the maximum crest working voltage whichever is higher.

1.2.4 Characteristics curves of the diodes indicating power loss, forward voltage drop, slope resistance, thermal resistance characteristics and characteristics curves of the fuse shall be submitted in A4 size.

1.2.5 The permissible junction and case temperature for the device shall be declared.

1.2.6 Diodes in the cubicle shall belong to one FVD group while they shall be in three consecutive FVD groups for all the units to be supplied. FVD shall have a band width of 50 milli-volts at the full rated diode current.

1.2.7 The semiconductor device junction temperature shall be calculated for (n-1) condition operation at rated permissible current for three duty cycles after temperature stabilisation in heat run test at a current value equal to the one hour rating of the traction motors.

For this purpose, RMS value of the starting current over the notching up duration for 1 minute followed by RMS value of the steady state one hour rating current for eight minutes, followed by zero current for thirty seconds will form one cycle. At the end of three such successive cycles the junction temperature shall be computed. There shall be enough margin.

1.2.8 The devices shall meet all the requirements as per IS:7788.

1.2.9 The use of capsule type diodes are acceptable.

### **1.3 Snubber and Damping Networks**

1.3.1 Each diode shall be provided with RC network to overcome the hole storage effect.

1.3.2 RC damping networks shall be provided to protect against switching surges expected. Supporting calculations shall be furnished.

1.3.3 The resistors and capacitors for the RC network shall be respectively of silicon coated, non-bursting type suitable for traction duty duly approved by RDSO.

1.3.4 Resistances – Silicon coated, non-inductive, wire wound resistors and stud mounting type with lug terminals shall be used. The wattage ratings shall be three times the calculated maximum wattage in the circuit under worst loading and high ambient conditions.

1.3.4 Capacitors – shall be of non- bursting type. The clearance and creepage distance between the live terminals and also the body shall comply with table 5 of IS-7788. The maximum working voltage across any capacitor shall not exceed 50% of the rated repetitive voltage. In the case of hole storage capacitors the voltage rating shall not to be less than PIV rating of the semiconductor device. The capacitors shall be designed for operation at 85 °C. The capacitors will be of IOHE CAR of GE make. Use of indigenous make shall have the prior approval of RDSO.

### **1.4 Fuses**

1.4.1 The diodes shall be protected by semi-conductor fuses whose selection shall be supported by the calculation to ensure their matching with the diodes.  $I^2 t$  values for the diode shall be more than the  $I^2 t$  for the fuse. Diode and fuse characteristics shall be furnished along with the tender. The fuse selection shall withstand the short circuit current expected.

**Note:** The expected short circuit current/impedance with duration shall be specified.

1.4.2 The semiconductor fuses used for the diode protection shall be of approved makes. Fuses of la Ferraz, Bussman or English Electric make only are approved at present.



- 1.4.3 Since the rectifier unit consists of multi-bridges connected in parallel, signaling fuses, associated suitable relays and micro switches shall be provided to give an indication in case of single bridge failure and to trip the load on the alternator in case of double bridge failure.

## **1.5 Constructional Features**

- 1.5.1 The tenderer shall submit details of the overall dimensions of the rectifier along with the offer.

- 1.5.2 The cubicle as well as internal sub-assemblies shall be interchangeable from one unit to the other.

- 1.5.2.1 The cubicle shall be of cold rolled steel metal sheet with strong frame work suitable for underframe mounting to withstand shocks and vibrations encountered in service run with a maximum speed of 105 kmph. This shall be protected against damages due to ballast hitting. The minimum thickness of panels shall be 12.0mm and may be increased as panel width increases as mentioned below.

| <b><u>Maximum Panel Width</u></b> | <b><u>Thickness</u></b> |
|-----------------------------------|-------------------------|
| Upto 750 mm                       | 2.0 mm                  |
| > 750mm but < 1500 mm             | 2.5 mm                  |
| >1500 mm but < 2000 mm            | 3.2 mm                  |

- 1.5.2.3 The cubicle shall be provided with two numbers of earthing bosses with M12x20 tapped hole on each side. The bosses shall have 5 mm thick copper/brass plate brazed.

- 1.5.3 Easily interchangeable inspection doors with locking arrangement shall be provided to facilitate easy access to vital parts like fuses, diodes etc.

- 1.5.4 Withdrawable bridge racks consisting of diodes, fuses and associated components shall be provided on rails for withdrawing during maintenance.

- 1.5.5 The equipment layout shall provide easy accessibility for maintenance.

- 1.5.6 Suitable ventilating louvers shall be provided for air outlet.

- 1.5.7 The devices with heat sink shall be mounted of FRP (SMC)/ Epoxy panels of adequate thickness (not less than 10mm) with hand holds for easy removal and insertion in position.

- 1.5.7.1 Heat sinks shall be of extruded constructions. The sand casted or gravity die casted are not acceptable. OHE care shall be taken to

have proper surface finish and surface flatness. Current collection through heat sink shall be avoided. In case it is not possible, the heat sink device mounting surface and the current collection contact area shall be treated to prevent electro corrosion and bimetallic action.

1.5.7.2 Recommended optimum pressures for mounting the devices on the heat sink shall be furnished. Suitable thermal compound having low thermal resistance shall be used to fill up the void between the mating surfaces of heat sink and device. The same shall seal the joint against moisture.

**Note** : Transient thermal impedance characteristics curves of the heat sink at different cooling air rate shall be submitted for approval.

1.5.8 Blower shall be mounted as an independent unit connected suitably to the duct with adequate resistance to reduce vibrations. Blower Motor shall be easily accessible for maintenance.

1.5.9 The unit shall be painted with two coats of red oxide followed by two coats of white stove enamel on inside and aircraft grey on outside to IS-5:1961.

1.5.10 Fasteners used in the cubicle shall be of minimum M6 and screws of M10 and above shall be of high tensile strength.

1.5.10.1 Studs of the terminal board shall have adequate current rating with minimum size not less than M6 and shall be coated with cadmium plating. The method of connections shall be such that the current should not pass through the studs. Number of connections per stud shall be limited to two. The insulating boards shall be fire retarding FRP sheet moulding type. They shall pass the fire retardant test as per specification IS - 2046. Separate terminal board shall be provided for different voltages. Positive and negative terminals shall be separately located. All the terminal studs shall be legibly identified with their circuit numbers.

1.5.11 The bus sizes on the a.c. & d.c. sides shall be such that the final temperature when corrected to 47 °C ambient is not more than 100 °C copper bus bar must be tin plated after bending/drilling the required holes, with thickness of plating not less than 8 microns.

1.5.11.1 The bus bars used shall be of high conductivity electrolytic copper as per IS:613 with current density not exceeding 4 A/mm<sup>2</sup>. The bus bar shall have colour code with red, yellow and blue on the a.c. side and brown and black respectively for positives and negatives on the d.c. side. Bus bars supports shall be made with insulators and be

identified by engraving the respective circuit numbers with contrast colour paint applied on the engraved marking.

- 1.5.12 All the cable wire ends shall be terminated with suitable sockets using proper dies and tools.
- 1.5.13 Cables – All the cables/wires shall be multi-strand flexible insulated cables conforming to E/14-01/parts I,II and III. PTFE insulated cables of adequate voltage rating and size shall be used for inter-connection snubber circuits and signaling fuses.
- 1.5.14 All the wires shall be numbered with cables ferrules of approved design on both ends of the cables.
- 1.5.15 Wiring layout- The quality of workmanship and layout of wiring shall be of high standard to ensure long life. The following guidelines shall be kept in view.
  - a) Complete separation of low, medium and high voltages.
  - b) Separation temporarily and permanently energised cables with separate bunching.
  - c) Avoiding of sharp bends.
  - d) Provision of grommets for cables entries.
  - e) Supporting of cable bunches with insulated supports using nylon ties.

## **2.0 Tests :**

- 2.1 Type tests on silicone diodes – At least ten diodes shall be subjected to type tests as per IS-7788 in the presence of RDSO Inspecting Official sufficiently in advance to avoid delay of prototype testing of the rectifier unit.
- 2.2 Routine tests on each diode shall be conducted as per IS-7788 and the results recorded by the manufacturer. 10% of the lot offered selected at random shall be subjected to routine tests in the presence of inspecting official of RDSO.

## **2.3 Type test on Rectifier assembly:**

- 2.3.1 Temperature rise test – with normal ventilation, the rectifier shall be subjected to the duty cycle expected on the traction motors with the temperature maintained at 47°C and until steady temperature is obtained. The temperature stabilisation can be deemed when three successive readings taken at 15 minutes intervals do not vary by more than 0.5 °C. The maximum diode junction temperature arrived shall be less than the permissible junction temperature as declared by the diode manufacturer after the duty cycles as described in clause 1.2.7

- of Annexure-5. The temperature rise test shall be conducted both for n and (n-1) bridge conditions.
- 2.3.2 Heat run test with (n-1) parallel paths will be conducted on first prototype and afterwards the test may be conducted corresponding to normal duty cycle with all bridges in operation.
- 2.3.3 Fuse blade temperature and bus temperature shall not exceed 100 deg. C for (n-1) parallel paths.
- 2.3.4 Instruments used for type testing shall be of 0.5 class accuracy and shall have been calibrated within 6 months from the date of testing.
- 2.3.5 Power losses measured for the diodes shall not exceed 10% of the declared value.

3. **Guarantee:**

The diodes of the main Rectifier shall be guaranteed for satisfactory working for a period of five years from the date of commissioning.

**ANNEXURE - 6****DESIGN OF TRACTION MOTORS AND SWITCH GEARS**

- 1.0 Number and arrangement of motors
- 1.1 Each OHE car shall be fitted with four numbers of DC series traction motors, two on each bogie. The motors shall be axle hung nose suspended type and shall be series wound, working on the pulsating current. The motors shall be designed to comply with the conditions stipulated in IEC-60349. The temperature rise allowed by IEC shall be reduced by 30 Deg. C, to allow for higher ambient temperatures. All motors shall be permanently connected in parallel.
- 1.2 The motor shall be designed to comply with the operating requirements specified with exceeding the temperature-rise limits.
- 1.3 The motors shall be so designed that severe damage will be avoided in case of transients such as fluctuations of the voltage, switching surges. The traction motor circuit shall comprise all the protective devices which will prevent any damage to them due to transients. The general design and maintenance of the motors shall be of the highest standard in accordance with the modern traction practices. The particulars of the motors shall be furnished as per Annexure 4.
- 1.4 The motor contactor shall be of Electro-pneumatic type with blow out coils and arcing horns etc. to break the current without detriment to their working parts or adjacent equipment. All contact tips, interlocks, pins and plungers shall be easily assessable for maintenance. The motor contactor shall be capable to open the circuit on overload and under fault condition.

**ANNEXURE -7****PARTICULARS TO BE SUPPLIED FOR THE INSPECTION OHE CAR**

The following data shall be supplied for the OHE car along with the tender offer:

|    |  |                                 |
|----|--|---------------------------------|
| 1  | Length of the OHE car over head stock.   | ...mm                           |
| 2  | Total wheel rigid base   | ...mm                           |
| 3  | Height of OHE car floor (under tare)   | ...mm                           |
| 4  | Distance between bogie centers.  |                                 |
| 5  | Distance between side buffers  | ...mm                           |
| 6  | Height of buffers when wheels are:   |                                 |
|    | (i) New .....  | mm                              |
|    | (ii) Fully worn out.....   | mm                              |
| 7  | Maximum height of the OHE car with wheels in new condition.  | ...mm                           |
| 8  | Maximum height of the cab at corners with wheels in new condition.                                   | ...mm                           |
| 9  | Maximum width of the OHE car.  | ...mm                           |
| 10 | Minimum height above rail level of any component with the OHE car wheels in maximum worn conditions. | ...mm                           |
| 11 | Reduction in the above height in the event of spring rigging failure.                                | ...mm                           |
| 12 | Diameter of wheels over tread  | ...mm (new)<br>...mm (worn out) |
|    | 13 Axle load ...t (max.)<br>....t (min.)   |                                 |
| 14 | Total weight of the OHE car.   |                                 |
|    | - in fully loaded condition  | ...t                            |
|    | - in empty condition   | ...t                            |
| 15 | Maximum speed of the OHE car.  |                                 |
|    | - attached to a train  | ...km/h                         |
|    | - Self-propelled   | ...km/h                         |
| 16 | Maximum Tractive effort at rail  | ...kg                           |
| 17 | Maximum continuous Tractive effort   | ...kg                           |
| 18 | Maximum speed of operation at maximum continuous Tractive effort.                                    | ...km/h                         |
| 19 | (a) Fuel oil consumption at 75% of rated output of the diesel engine.                                | ...litre/h                      |
|    | (b) Lubricating oil consumption at 75% of rated output of the diesel engine.                         | ...litre/h                      |

## Annexure-8-A

List of tools for maintenance work and repair of minor fault.

| Sl.No.  | Tool description               | Make | Quantity |
|---|--------------------------------|------|----------|
| 1   | Box spanner set 10-34 mm       |      | 1 set    |
| 2   | Ring Spanner 6-33 mm           |      | 1 set    |
| 3   | Double end spanner set 6-36 mm |      | 1 set    |
| 4   | Grease gun                     |      | 1        |
| 5   | Torque wrench EVT 2000@        |      | 1        |
| 6   | Pipe wrench 18"                |      | 1        |
| 7   | Hammer 2 Lbs                   |      | 1        |
| 8   | Screw Driver 6"                |      | 1        |
| 9   | Screw Driver 12"               |      | 1        |
| 10  | Chisel 6"                      |      | 1        |
| 11  | Cutting plier                  |      | 1        |
| 12  | L N key set 3 to 17            |      | 1 set    |
| 13*   | Emergency Spares               |      | 1 Kit    |
| *Emergency Spares: consists of Fuses, Control Panel lamps, MCBs and Critical Hoses. |                                |      |          |
| Make to be indicated in the column  |                                |      |          |

## Annexure-8-B

Testing Kit for 8-wheeler Diesel electric Inspection & Maintenance Car.

| Sl.No.                             | Tool description  | Make | Quantity (Nos) |
|------------------------------------|---|------|----------------|
| 1                                  | Injector adjustment Kit   |      | 1              |
| 2                                  | Vacuum gauge 90-30 inch of Hg)  |      | 1              |
| 3                                  | Pressure Gauge( 0-30 PSI)   |      | 1              |
| 4                                  | Hand tacho Meter(0-3000 RPM)  |      | 1              |
| 5                                  | Dial gauge (Least Count=0.001")   |      | 1              |
| 6                                  | Magnetic gauge  |      | 1              |
| 7                                  | Megger 500 V  |      | 1              |
| 8                                  | Multi-Meter (DC Range: 400 mV AC Range: 400mV-750 V) Resistance: 400 ohm to 40 Mega ohms) |      | 1              |
| Make to be indicated in the column |   |      |                |

## Annexure-8-C

Special tools.

| Sl.No. | Tool description                  | Make | Quantity |
|--------|-----------------------------------|------|----------|
| 1      | Axle Box Hydraulic Bearing puller |      | 1        |

## Annexure-8-D

Training material in Hindi and English with each 8-wheeler Diesel Electric Inspection & Maintenance Car.

| Sl.No. | Tool description                       | Quantity |
|--------|--|----------|
| 1      | Training notes/ Write up with diagrams | 2 Nos    |
| 2      | Slides/Wall charts                     | 2 Nos    |



**INVITATION FOR BIDS (IFB)**  
**(DOMESTIC COMPETITIVE BIDDING)**

**NTPC LIMITED**  
**(A GOVERNMENT OF INDIA ENTERPRISE)**

*Central Procurement Group-I, Raipur*

**INVITATION FOR BIDS (IFB)**  
**(DOMESTIC COMPETITIVE BIDDING)**

**FOR**

**Procurement of Diesel Electric Tower Car for OHE Maintenance at NTPC Lara.**

NTPC invites online bids on Single Stage-Two Envelope bidding basis "Procurement of Diesel Electric Tower Car for OHE Maintenance at NTPC Lara" as per the Brief Scope of Work mentioned hereinafter.

1. Brief Details:

|                          |                           |
|--------------------------|---------------------------|
| <b>NIT No.</b>           | NTPC/USSC-CPG1/9900267098 |
| <b>Tender Fees</b>       | Not Applicable            |
| <b>EMD</b>               | <b>INR 10,00,000.00</b>   |
| <b>Completion period</b> | 06 months                 |

**General Terms & Conditions:**

1. Notwithstanding anything stated above, NTPC reserve the right to assess bidder's capability and capacity of the bidder for carrying out the supplies and the decision of NTPC in this regard shall be final.
2. NTPC reserves the right to accept or reject any or all the tenders in part or full including rejection of any request for issue of tender documents, alter the quantities or split the order without assigning any reason thereof.
3. Above details are only indicative. Other detailed terms and conditions shall be as per tender documents.

Address for Communication:

GM (C&M)-CPG-1/ AGM(C&M)-CPG-1  
NTPC Limited, Western Region II Headquarters,  
Plot No-87, Sector-24, Atal Nagar,  
Naya Raipur, Raipur  
Chhatisgarh-492018  
Email:-

[dppradhan@ntpc.co.in](mailto:dppradhan@ntpc.co.in)/[amitksingh@ntpc.co.in](mailto:amitksingh@ntpc.co.in)/[hemantkumar03@ntpc.co.in](mailto:hemantkumar03@ntpc.co.in)

## **Qualifying Requirements (QR)**

### **1.0 Qualifying Requirements:**

The bidder who wishes to participate in the bidding shall meet the Qualifying Requirements stipulated hereunder:

#### **1.1 Technical Criteria:**

**1.1.1** The bidder should be a 'manufacturer of 'Diesel Electric Tower Wagon/Car for Over Head Electrification Maintenance'.

**AND**

**1.1.2** The bidder should have executed the order(s) for supply of 'Diesel Electric Tower Wagon/Car for OHE Maintenance' during the preceding seven (07) years prior to date of Techno- commercial bid opening in any of the following manner:

(i) One (1) order having executed value not less than **Rs. 693 Lakhs** in a single order.

**OR**

(ii) Two (2) orders having executed value not less than **Rs. 433 Lakhs** two orders each.

**OR**

(iii) Three (3) orders having executed value not less than **Rs. 346 Lakhs** three orders each.

#### **Notes for Technical Criteria:**

(i) The word "Executed" mentioned above means that the bidder should have achieved the criteria specified above, even if the total contract is started earlier and/or is not completed/closed.

(ii) In case of orders under execution, the value of the order executed prior to the date of Techno-Commercial bid opening duly certified by bidder's client shall be considered acceptable.

(iii) For arriving at the executed value of work specified above, basic amount only shall be considered. In case contract is inclusive of taxes, bidder should provide the break-up of basic value and taxes.

(iv) Latest annual report OR NSIC / SSI / MSME registration certificate / BIS license / ISO certificate / Certificate of registration from the concerned excise department / any other statutory document as a proof of being manufacturer as per QR.

#### **1.2 Financial Criteria:**

**1.2.1** The Average Annual Turnover of the Bidder, should not be less than **Rs. 866 Lakhs (Rupees Eight crore sixty-six Lakhs Only)** during the preceding three (3) completed financial years as on the date of Techno-Commercial bid opening.

1.2.2 In case the bidder does not satisfy the financial criteria, stipulated at Cl. 1.2.1 above on its own, its Holding Company would be required to meet the stipulated turnover requirements at Cl. 1.2.1 above, provided that the net worth of such Holding Company as on the last day of the preceding financial year is at least equal to or more than the paid-up share capital of the Holding Company. In such an event, the bidder would be required to furnish along with its Techno-Commercial bid, a Letter of Undertaking from the Holding Company, supported by Board Resolution, as per the format enclosed in the bid documents, pledging unconditional and irrevocable financial support for the execution of the Contract by the bidder in case of award.

1.2.3 In case the bidder is not able to furnish its audited financial statements on stand-alone entity basis, the unaudited unconsolidated financial statements of the bidder can be considered acceptable provided the bidder further furnishes the following documents for substantiation of its qualification.

- Copies of the unaudited unconsolidated financial statements of the bidder along with copies of the Audited consolidated financial statements of its Holding Company.
- A Certificate from the CEO/CFO of the Holding Company, as per the format enclosed in the bidding documents, stating that the unaudited unconsolidated financial statements form part of the Consolidated Annual Report of the company.

1.2.4 In cases where audited results for the last preceding financial year as on the date of Techno-Commercial bid opening are not available, the financial results certified by a practicing Chartered Accountant shall be considered acceptable. In case, Bidder is not able to submit the Certificate from practicing Chartered Accountant certifying its financial parameters, the audited results of three consecutive financial years preceding the last financial year shall be considered for evaluating the financial parameters. Further, a Certificate would be required from the CEO/CFO as per the format enclosed in the bidding documents stating that the financial results of the Company are under audit as on the date of Techno-Commercial bid opening and the Certificate from the practicing Chartered Accountant certifying the financial parameters is not available.

**Notes for 1.2:**

1. Other income shall not be considered for arriving at annual turnover.
2. "Holding Company" and "Subsidiary Company" shall have the meaning ascribed to them as per Companies Act of India, in vogue.

3. Net worth means the sum total of the paid up share capital and free reserves. Free reserve means all reserves credited out of the profits and share premium account but does not include reserves credited out of the revaluation of the assets, write back of depreciation provision and amalgamation. Further, any debit balance of Profit and Loss account and miscellaneous expenses to the extent not adjusted or written off, if any, shall be reduced from reserves and surplus.

**NOTE:**

- A. 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.
- B. Issuance of bid documents to any Bidder shall not construe that such bidder is considered to be qualified.

**DOCUMENTS TO BE SUBMITTED BY THE BIDDER WITH THE TECHNICAL BID:**

1. Legible copies of the following documents duly authenticated by the authorized representative of the bidder shall be submitted in support of the qualifying requirements along with technical bid:
2. Copy of Deed of Joint undertaking, if applicable. Original copy must be sent in sealed envelope with offline documents like Tender fee etc.
3. Relevant Order copies along with Proof of Execution (copy of Invoice, Shipping Documents, Certified copy of Bank Statement of payment etc)
4. Soft copy of Micro & Small Enterprise (MSE) certificate, as an exemption certificate in lieu of Tender fee/EMD, should also be uploaded in Fee/EMD envelope of online bid.
5. Copy of Profit & Loss Account & Balance Sheet for the preceding three (3) completed financial years as on date of bid opening.
6. Copy of Power of Attorney of Authorized Signatory (if applicable).
7. Other documents in support of QR.

**SPECIAL PURCHASE CONDITIONS (SPC)**

(The conditions in this section will supersede any other related conditions anywhere else in this tender document)

**Special Purchase Conditions – Volume II Section I**

*'Class-I local suppliers' only are eligible to participate in this tender, as defined in the bidding documents/ Public Procurement (Preference to Make in India), Order 2017 and its subsequent amendments/ revisions issued by DPIIT. The bidders may apprise themselves of the relevant provisions of bidding documents in this regard before submission of their bids.'*

|            |   |  |
|------------|---|--|
| <b>1.0</b> | <b>TYPE OF BIDDING</b>                            | Single stage Two Envelope  |
| <b>2.0</b> | <b>REVERSE AUCTION RULES</b>                      | NOT APPLICABLE   |
| <b>3.0</b> | <b>PRICE BASIS</b>                                | <b>FOR NTPC LARA STORES BASIS</b><br>Bidders are requested to indicate the Price on “FOR NTPC Site” basis.   |
| <b>4.0</b> | <b>Tender Fee</b>                                 | Not Applicable   |
| <b>5.0</b> | <b>EARNEST MONEY DEPOSIT (EMD) / BID SECURITY</b> | <p>FOR SUBMISSION OF EMD: The Bidder shall furnish, as a part of his Bid an Earnest Money Deposit / Bid of for the amount as specified in the GeM portal in a sealed envelope, super scribed on the top as under:</p> <p>Tender Number _____</p> <p>Tender Subject _____</p> <p>Due Date of Bid Opening _____ (Date of Techno-Commercial Bid Opening)</p> <p>From _____ (Name of the Bidder).</p> <p><b>EMD envelope shall be submitted to:</b></p> <p>Amit Kumar Singh, AGM(C&amp;M)<br/>NTPC Limited, Western Region II Headquarters,<br/>Plot No-87, Sector-24, Atal Nagar, Naya Raipur,<br/>Raipur Chhatisgarh-492018</p> <p>The Earnest Money Deposit (EMD) shall in the form of Bank Guarantee from banks specified in the published GeM bid or in form of Insurance Surety Bond from an Insurer as per guidelines issued by Insurance Regulatory and Development Authority of India (IRDAI).</p> <p><b>The format of the Bank Guarantee shall be in accordance with the form of Bank Guarantee towards Bid Security/EMD/Performance security included in the Employer’s Bidding Documents only. In addition, the format of the Insurance Surety Bond shall also be in accordance with the form of Insurance Surety Bond towards Bid security/Performance security included in</b></p> |

|     |   |  |
|-----|---|--|
|     |   | <p><b>the Employer’s Bidding Documents only.</b></p> <p><b>Any bid not accompanied by an acceptable bid security in a separate sealed envelope shall be rejected by the Employer as being non-responsive.</b> The BG/ Insurance Surety Bond towards EMD shall remain valid for a period of forty-five (45) days beyond the original Bid validity period or beyond any extension in the period of Bid validity subsequently requested.</p> <p>1) Scanned copy of EMD BG/ Insurance Surety Bond towards EMD to be mandatorily submitted along with offer on Gem portal.</p> <p>2) The bidders are requested to send the required documents (EMD, in case submitted by way of BG in Original in sealed envelope well in advance so as to be received by the respective officer (latest within 5 days of bid opening as mentioned in Gem GTC), failing which bid is liable for rejection. NTPC shall not be liable for loss/ non-receipt/ late receipt of EMD in postal transit.</p> <p>3) EMD Exemption shall be governed by latest Gem GTC. As per MSME Notification S.O. 2119 (E) dated 26th June 2020, from 1st June 2022, Udyam registration shall be the ONLY valid MSME Registration Document.</p> <p>Except Udyam Registration Certificate no other registration documents will be considered for MSEs exemption &amp; benefits for bids, unless until GOI extend the validity of other MSEs registration certificate. The benefit as above to MSEs shall be available only for Goods/Services produced &amp; provided by MSEs. As per answer to FAQ no. 18 circulated vide Office Memorandum F. No. 22(1)/2012-MA dated 24.10.2016 “Policy is meant for procurement of goods produced and services rendered by MSEs. However, traders are excluded from the purview of benefits and exemption of MSEs. In case of an upward change in terms of investment in plant and machinery or equipment or turnover or both, and consequent re-classification, an enterprise shall continue to avail of all non-tax benefits of the category (micro or small or medium) it was in before the re-classification, for a period of three years from the date of such upward change.</p> <p>Note: Tender is basically a material procurement case and accordingly MSE bidders registered under service category are not eligible for MSE benefit/EMD exemption.</p> |
| 6.0 | Information regarding EMD BG submission | In case of Bidders opting for Bank Guarantee as Bid Security but unable to send the Original Bank Guarantee in physical form at the tender opening location before the deadline for submission of bids, following shall also be considered acceptable:   |

|                   |   |   |   |           |                 |    |        |                        |     |              |   |    |           |             |
|-------------------|---|---|---|-----------|-----------------|----|--------|------------------------|-----|--------------|---|----|-----------|-------------|
|                   |   | <p>(i) The issuing bank shall intimate through their own official e-mail id to concerned C&amp;M department with a copy to Bidder regarding issuance / extension of Bank Guarantee (BG) along with following documents, before the deadline of submission of bids:</p> <p>(a) The scanned copy of the BG.</p> <p>(b) SFMS/SWIFT message acknowledgement copy sent to NTPC banker stating the date of sending.</p> <p>(c) An undertaking through official e-mail id of bank as per format enclosed at Annexure-A. (placed at end of this document) SFMS message must be sent to the Employer's bank.</p> <p>Details are mentioned at 7.0. SFMS confirmation shall be obtained by concerned NTPC executive from Employer's bank with regard to issuance of Bank Guarantee before award.</p> <p>(ii) Bidders shall be required to upload the scanned copy of the BG on e-tendering portal. Bidder shall also be required to submit the Original BG in physical form to reach NTPC at the address mentioned in Bidding Documents, not later than 10 days from the date of submission of Techno-Commercial bids or before the Price Bid opening, whichever is earlier, failing which its bid shall be rejected and not considered for further evaluation</p> |   |           |                 |    |        |                        |     |              |   |    |           |             |
| <p><b>7.0</b></p> | <p><b>CONFIRMATION OF BGS (CONTRACT PERFORMANCE GUARANTEE) THROUGH STRUCTURED FINANCIAL MESSAGING SYSTEM (SFMS)/SWIFT</b></p> | <p>While issuing the physical BGs, the Bidder's Bank shall also send electronic message through secure SFMS (in case of BGs issued from within India) or SWIFT (in case of BGs issued from outside India) to Employer's Beneficiary Bank whose details are provided above</p> <table border="1" data-bbox="643 1451 1374 1780"> <tr> <td>i</td> <td>Bank Name</td> <td>ICICI BANK LTD.</td> </tr> <tr> <td>ii</td> <td>Branch</td> <td>CONNAUGHT PLACE BRANCH</td> </tr> <tr> <td>iii</td> <td>Bank address</td> <td>9A, PHELPS BUILDING, INNER CIRCLE, NEW DELHI-110001</td> </tr> <tr> <td>iv</td> <td>IFSC Code</td> <td>ICIC0000007</td> </tr> </table> <p>BG issuing/amending bank must send the BG advice in the form of message format via SFMS (Structured Financial Messaging System) as provided by RBI. The format of the message for confirmation of the BG shall be as below:</p> <p>BG advising message: IFN 760COV/ IFN 767COV via SFMS</p> <p>Field Number: Particulars (to be mentioned in Row 1)</p>  | i | Bank Name | ICICI BANK LTD. | ii | Branch | CONNAUGHT PLACE BRANCH | iii | Bank address | 9A, PHELPS BUILDING, INNER CIRCLE, NEW DELHI-110001 | iv | IFSC Code | ICIC0000007 |
| i                 | Bank Name   | ICICI BANK LTD.   |   |           |                 |    |        |                        |     |              |   |    |           |             |
| ii                | Branch  | CONNAUGHT PLACE BRANCH  |   |           |                 |    |        |                        |     |              |   |    |           |             |
| iii               | Bank address  | 9A, PHELPS BUILDING, INNER CIRCLE, NEW DELHI-110001   |   |           |                 |    |        |                        |     |              |   |    |           |             |
| iv                | IFSC Code   | ICIC0000007   |   |           |                 |    |        |                        |     |              |   |    |           |             |

|      |                                       |  |
|------|---------------------------------------|--|
|      |                                       | 7037: NTPCBG (unique identifier)   |
| 8.0  | VALIDITY OF OFFER                     | <b>120 days</b> from the date of opening of the 'Technical & Commercial Bid' by NTPC   |
| 9.0  | TRANSFER OF BID DOCUMENTS             | Not applicable.  |
| 10.0 | QUALIFYING REQUIREMENTS               | <p><b>Given in Notice Inviting Tender (NIT) at previous pages, Please read and submit the required documents.</b></p> <p>The bidder shall be required to submit duly certified and verified documents from their Statutory Auditors or specified Third Party Inspection Agency (TPIA) in support of meeting Technical QR along with a certificate regarding verification of authenticity of documents as per the format placed at Annexure-II (Undertaking from Statutory Auditor) and/ or Annexure III (Undertaking from TPIA). All the documents submitted by the bidder in support of meeting Technical QR shall be digitally signed by the Statutory Auditor and/ or specified TPIA”</p> <p>Further, wherever information can be drawn from books of accounts, records and other relevant documents, Bidders can also submit a certificate issued by their Independent Statutory Auditor certifying the data required for meeting the Technical Qualification Requirements.</p> <p>Details of submitted copy of Purchase Orders/ Work Orders / Contract Agreements, Client Certificates etc.), duly certified and verified by statutory auditors or specified TPIA should also be entered in Annexure 12/12 A.</p> |
| 11.0 | NIL DEVIATION CERTIFICATE             | This is a non-negotiable tender and any deviation on any condition(s) of this SPC may render the bid as non-responsive so to be accepted to the extent possible. The agency has to submit the Certificate of “NIL” Deviation as per the attached Proforma (Annexure- 01)   |
| 12.0 | COMPLIANCE ON QUALIFYING REQUIREMENTS | <p><b>Verification of authenticity of Documents submitted by the bidder in support of meeting the Technical QR</b></p> <p>The bidder shall be required to submit duly certified and verified documents from their Statutory Auditors OR specified TPIA in support of meeting Technical QR. All the documents submitted by the bidder in support of meeting Technical QR shall be digitally signed by the Statutory Auditor and/ or specified TPIA.</p> <p>In case documents are certified &amp; verified for authenticity through TPIA, the verification and</p>   |



certification of authenticity of documents is acceptable from any of the following TPIAs:

(1) *Société Générale de Surveillance / SGS India Pvt. Ltd. (SGS)*

(2) *Gulf Lloyds Industrial Services (India) Pvt. Ltd.(GLISPL)*

(3) *International Certification Services (ICS)*

(4) *TUV Rheinland (India) Pvt. Ltd.*

(5) *TÜV SÜD South Asia Pvt. Ltd.*

(6) *TUV India Pvt. Ltd. (TÜV Nord Group)*

(7) *Intertek India Pvt. Ltd.*

(8) *Moody International (India) Pvt. Ltd.*

(9) *RINA India Pvt. Ltd.*

(10) *Competent Inspectorate and Consultants LLP*

***Any document pertaining to reference works/ plants in support of Technical QR, which is not certified by specified TPIA or Statutory Auditor of the bidder, as per the format enclosed with the bidding documents, shall not be considered verified/ certified for the purpose of evaluation, and the bid may be liable for rejection.***

The Bidder shall be responsible to get their documents/ credentials in support of Qualifying Requirements verified & certified by their Statutory Auditor(s) and/ or specified TPIAs. All the costs pertaining to third party verification and certification (including those by statutory auditors) shall be borne by the Bidder. Employer shall have no liability (financial or otherwise) towards the same and shall not be liable for any claim/ dispute between the bidder and TPIA and/ or Statutory Auditor.

***These references shall only be considered to ascertain the bidder's compliance to Qualifying Requirement (QR).*** No claims without supporting documents shall be accepted in this regard.

If any of the reference work pertains to the Contract(s)/Works executed by Bidder for NTPC or Subsidiary / JV companies of NTPC in the past then in respect of such Contract(s)/Works, Bidder shall not be required to enclose Client Certificate (s) along with its bid.

In case a bidder submits documents/credentials duly certified/ verified by Independent Statutory Auditor or specified TPIA for an earlier tender of NTPC including its JV/Subsidiary, the same may be considered for the purpose of evaluation.

Where appointment of Statutory Auditor is not mandatory as per statute under which bidder has been incorporated, the option of certification from specified TPIA shall only be considered for such bidder.

Bidders wishing to provide additional Work

|      |  |  |
|------|--|--|
|      |  | Orders/Purchase Orders/Letter of Awards/Contract Agreements are required to declare the same in similar format which shall be additionally attached and uploaded. <b>However, bidders are not permitted to give reference of more than three Work Orders/Purchase Orders/Letter of Awards/Contract Agreement for Qualifying Requirements.</b>  |
| 13.0 | JURISDICTION                                 | Raipur   |
| 14.0 | PLACE OF ARBITRATION                         | New Delhi, India   |
| 15.0 | INSURANCE                                    | Transit Insurance shall be inclusive in bidder's quoted price.   |
| 16.0 | FREIGHT                                      | Freight charges shall be inclusive in bidder's quoted price.   |
| 17.0 | DELIVERY AND COMPLETION SCHEDULE             | <b>06 months from date of issue of GeM Contract.</b>   |
| 18.0 | PAYMENT TERMS                                | <b>100% of Product Cost Payable on Product Delivery (within 10 days of CRAC generation).</b>   |
| 19.0 | Performance Bank Guarantee (PBG)             | The successful bidder shall be required to furnish the Contract Performance Guarantee (CPG) for an amount equal to <b>10.00% of awarded value for each GeM Contract</b> . CPG should be valid for a period of three months (3 months) beyond the warranty period. CPBG shall be released after expiry of warranty period. The CPG should be submitted within 30 days of placement of award.                  |
| 20.0 | TAXES & DUTIES                               | Inclusive  |
| 21.0 | WARRANTY / GUARANTEE/DEFECT LIABILITY PERIOD | Warranty shall be 30 months from date of supply or 24 months from date of successful commissioning of the item at NTPC Lara site whichever is earlier.   |
| 22.0 | INSPECTION                                   | <b>Pre Dispatch Inspection (PDI) will be done by M/s RITES/RDSO/Railway at agency's works. These certificates from RITES/RDSO/Railway shall be checked and verified at NTPC Lara site.</b><br><br><b>RDSO charges for design loan charges, drawing approval charges and inspection charges will be in vendor's account.</b><br><br><b>Co-ordination with Railway Authorities shall be in vendor's scope.</b> |

|      |   |   |
|------|---|---|
| 23.0 | INTEGRITY PACT  | Not applicable  |
| 24.0 | Evaluation Criteria   | Itemwise and Splitting of Quantities <b>NOT</b> allowed.  |
| 25.0 | Price Adjustments   | Firm Price  |
| 26.0 | <p>Preference to Make In India and Eligibility for Participation/ granting of Purchase Preference to Class-I local suppliers-regarding</p> <p>(Refer Annexure-I to SPC below for details)</p> | <p><b>'Class-I local suppliers' only are eligible to participate in this tender.</b></p> <p>'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the <b>minimum local content of 60%</b>.</p> <p>'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the <b>minimum local content 20%</b> but less than that prescribed for 'Class-I local supplier' above.</p> <p>'Non-Local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than that prescribed for 'Class-II local supplier'.</p> <p><b>Eligibility for Participation:</b><br/> <b>Only Class-I Local suppliers are eligible to Bid for specified items in Bidding documents.</b> Bids received (if any) for specified item(s) from Class-II and Non-Local Supplier shall be considered non responsive and shall not be evaluated in respect of such item(s).</p> <p><b>Note:</b> The 'Class-I local supplier' shall be required to provide, in the Attachment-13 (format attached below) of Techno- Commercial Bid, self-certification / declaration that the Item offered meets the local content requirement for 'Class-I local supplier' and shall give details of the location(s) at which the local value addition is made.</p> <p><b>A supplier who has been debarred / banned by any other procuring entity for violation of 'Public Procurement (Preference to Make In India), Order 2017' (PPP-MII Order) dated 15.06.2017 and its subsequent revisions / amendments issued by Department of Industrial Policy and Promotion (DIPP) shall not be eligible for evaluation/preference, as applicable, under the aforesaid procedures for duration of the debarment. The 'Class-I local supplier' shall be required to furnish a confirmation in this regard in the Attachment-13 (format attached below)</b></p> |

|      |  |  |
|------|--|--|
|      |  | <p><b>of Techno-Commercial Bid.</b></p> <p>In case a bidder does not submit the aforesaid declaration or statement/any declaration like 'later', 'to be furnished later', 'NA' etc. are indicated by the bidder, then the Bidder is liable not to be considered as a local supplier and may not be eligible for any purchase preference and its bid is liable to be considered non-responsive and may be rejected.</p>   |
| 27.0 | <b>MSE Benefits</b>  | <p>Benefits under PPP 2012 for MSEs as elaborated at ITB Clause 4.0 are applicable only for (a) Goods produced and (b) Services provided by MSEs. MSE benefits shall not be applicable to Trader/Dealer of Goods.</p> <p>Except Udyam Registration Certificate no other registration documents will be considered for MSEs benefits. The benefit as above to MSEs shall be available only for Goods/Services produced &amp; provided by MSEs.</p> <p>MSE Bidders must attach duly filled and signed Annexure-A1 (format available below) along with valid MSE registration in their online bid failing which MSE benefits may not be extended to them. No further claim in this regard shall be entertained by the Employer.</p> <p><b>In case of an upward change in terms of investment in plant and machinery or equipment or turnover or both, and consequent re-classification, an enterprise shall continue to avail of all non-tax benefits of the category (micro or small or medium) it was in before the re-classification, for a period of three years from the date of such upward change.</b></p> |
| 28.0 | <b>Restrictions on procurement from a Bidder of a country which shares a land border with India.</b> | <p><b>Bidders Eligible for Bidding:</b></p> <p>The Contractor shall not be allowed to sub- contract works to any sub-contractor/ sub-vendor from a country which shares a land border with India unless such sub-contractor is registered with the competent Authority.</p> <p>The Competent Authority for the purpose of registration shall be as mentioned in the F.NO. 6/18/2019-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division.</p> <p>However, the said requirement of registration will not apply to sub-contractors from those countries (even if sharing a land border with India) to which the</p>  |

|             |   |   |  |
|-------------|---|---|--|
|             |   | <p>Government of India has extended lines of credit or in which the Government of India is engaged in development projects. The Contractor may apprise itself of the updated lists of such countries available in the website of the Ministry of External Affairs.</p> <p>Bidding is open to bidders from within the Employer's country only subject to fulfilment of conditions specified in ITB Clause "Restrictions on procurement from a Bidder of a country which shares a land border with India".</p>          |  |
| <b>29.0</b> | <b>E-Way Bill</b>                                     | E-Way Bill if required shall be arranged by the vendor.   |  |
| <b>30.0</b> | <b>Anti-Bribery and Anti-Corruption (ABAC) Policy</b> | <p>Anti-Bribery and Anti-Corruption (ABAC) Policy: The Bidder and its employees along with its Associate/ Collaborator/ Sub- Contractors / Sub-Vendors / Consultants / Service Providers and all other persons associated with business of Employer shall strictly adhere to Anti- Bribery and Anti-Corruption (ABAC) Policy of Employer displayed on tender website <a href="https://ntpctender.ntpc.co.in/">https://ntpctender.ntpc.co.in/</a></p> <p>Please refer and submit the Appendix – C as a declaration</p> |  |
| <b>31.0</b> | <b>Bid to be addressed to</b>                         | <p><b>AGM(C&amp;M) CPG-1</b></p> <p>NTPC Limited, Western Region II Headquarters, Plot No-87, Sector-24, Atal Nagar, Naya Raipur, Raipur Chhatisgarh-492018 Email:-usgupta01@ntpc.co.in /</p>   |  |
| <b>32.0</b> | <b>CONTACT PERSONS / ADDRESS</b>                      | <p><b>Mr. Amit Kumar Singh</b><br/>AGM(C&amp;M), NTPC Limited, Western Region II Headquarters, Plot No-87, Sector-24, Atal Nagar, Naya Raipur, Raipur Chhatisgarh-492018</p>  | <p><b>Mr. D P Pradhan</b><br/>GM(C&amp;M), NTPC Limited, Western Region II Headquarters, Plot No-87, Sector-24, Atal Nagar, Naya Raipur, Raipur Chhatisgarh-492018</p> |
|             | <b>Email</b>  | <a href="mailto:amitksingh@ntpc.co.in">amitksingh@ntpc.co.in</a>  | <a href="mailto:dppradhan@ntpc.co.in">dppradhan@ntpc.co.in</a>   |

**ONLY CLASS-I LOCAL SUPPLIERS ARE ELIGIBLE TO BID AGAINST THIS TENDER**

**Sub: Preference to Make In India and Eligibility for Participation/ granting of Purchase Preference to Class-I local suppliers- regarding**

It is the policy of the Government of India to encourage 'Make in India' and promote manufacturing and production of Goods and Services in India with a view to enhancing income and employment. In this regard, the following guidelines, concerning the procedure to be adopted for granting Eligibility for Participation/purchase preference to local suppliers, are hereby issued:

**Definitions:**

- a) **'Local content'** means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the goods, services or works procured (excluding net domestic indirect taxes) minus the value of imported content in the goods, services or works (including all customs duties) as a proportion of the total value, in percent.
- b) **'Class-I local supplier'** means a supplier or service provider, whose goods, services or works offered for procurement, meets the **minimum local content of 60%**.  
**'Class-II local supplier'** means a supplier or service provider, whose goods, services or works offered for procurement, meets the **minimum local content 20%** but less than that prescribed for 'Class-I local supplier' above.  
**'Non-Local supplier'** means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than that prescribed for 'Class-II local supplier'.
- c) **'L1'** means the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.
- d) **'Margin of purchase preference'** means the maximum extent to which the evaluated bid price of a 'Class-I local supplier' may be above the L1 for the purpose of purchase preference.
- e) **Fraud Prevention Policy** – shall mean the policy related to prevention of fraud displayed on NTPC tender website <http://www.ntpctender.com>.
- f) **Policy & Procedure for Withholding & Banning of Business Dealings** – shall mean the policy related to Withholding & Banning of Business Dealings forming part of Bidding Document.

## Eligibility for Participation:

- (a) For tenders having Itemwise evaluation **(Refer evaluation criteria clause in SPC):**

Only Class-I local suppliers are eligible to Bid for specified items in Bidding documents. Bids received (if any) for specified item(s) from Class II Local Supplier and Non-Local Supplier shall be considered non-responsive and shall not be evaluated in respect of such item(s).

## Verification of Local Content:

The 'Class-I local supplier' shall be required to provide, in the Attachment-13 (format attached below) of Techno- Commercial Bid, self-certification / declaration that the Item offered meets the local content requirement for 'Class-I local supplier' and shall give details of the location(s) at which the local value addition is made.

In case the total bid price of the supplier / bidder is in excess of INR 10 crore, the 'Class-I local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content during execution prior to submission of last bill for payment.

In case aforesaid Certificate furnished by Contractor/Vendor is not in line with the declaration in respect of Local content in their bid, same shall be treated as false declaration.

False declarations will be dealt in line with the Fraud Prevention Policy and Policy & Procedure for Withholding and Banning of Business Dealings of NTPC.

In case of false declaration / violation of the provision of PPP-MII Order, if a bidder has been debarred / banned by NTPC, then the fact and duration of debarment should be promptly brought to the notice of the Member-Convenor of the Standing Committee (as per para 16 of PPP-MII Order) and the Department of Expenditure through Ministry of Power, GOI.

**A supplier who has been debarred / banned by any other procuring entity for violation of 'Public Procurement (Preference to Make In India), Order 2017' (PPP-MII Order) dated 15.06.2017 and its subsequent revisions / amendments issued by Department of Industrial Policy and Promotion (DIPP) shall not be eligible for evaluation/preference, as applicable, under the aforesaid procedures for duration of the debarment. The 'Class-I local supplier' shall be required to furnish a confirmation in this regard in the Attachment-13 (format attached below) of Techno-Commercial Bid.**

## Local Sourcing

The Bidder/its Sub-vendors must be Class-I local supplier for Item(s) mentioned at Bill of Materials in Technical Specifications, as applicable, in case such item(s) are Self Manufactured/Bought-out.

The Bidder / Contractor are requested to encourage and promote domestic manufacturing and production of goods and services by sourcing goods and services applicable under the contract / package from domestic suppliers / service providers. In this regard, Bidder shall also follow guidelines / advisory issued by Government of India from time to time, to the

extent applicable to them, regarding promotion of local sourcing of goods including Bought out Items and services.



**TENDERS HAVING ITEM WISE EVALUATION**

**Attachment - 13**

**PACKAGE:** \_\_\_\_\_  
**FOR** \_\_\_\_\_ **PROJECT BIDDING DOCUMENT NO** \_\_\_\_\_

**(Declaration on Local Content)**

Dear Sirs,

We have read the provisions of “Preference to Make in India and Eligibility for granting of Purchase Preference to Class-I local suppliers” enclosed with the SPC.

In terms of the requirement of the aforesaid provisions, we hereby declare that we have submitted our bids for only those item(s) for which we are eligible for participation as per provisions of the Bidding documents and we are Class-I local supplier for all such items.

The details of the location(s) at which the local value addition is made are as under:

| Sl. No. of BOQ | Description of Goods & Services | Details of the location(s) at which the local value addition is made |
|----------------|---------------------------------|--|
|                |                                 |  |
|                |                                 |  |
|                |                                 |  |
|                |                                 |  |
|                |                                 |  |

Further, we hereby confirm that we are presently not debarred / banned by any other procuring entity for violation of ‘Public Procurement (Preference to Make In India), Order 2017’ (PPP-MII Order) dated 15.06.2017 and its subsequent revisions / amendments issued by Department of Industrial Policy and Promotion (DIPP).

We agree to furnish any information as a proof of the above to your satisfaction as and when required.

NOTE: 1) Continuation sheets of like size and format, may be used as per Bidder's requirement and shall be annexed to this Attachment.

2) In case a Bidder has been banned/debarred by any other procuring entity for violation of ‘Public Procurement (Preference to Make In India), Order 2017’ (PPP- MII Order) dated 15.06.2017 and its subsequent revisions / amendments issued by Department of Industrial Policy and Promotion (DIPP), the same may be declared by Bidder by striking off para 2.0 above and declaring the details of banning using additional sheets which shall be annexed to this Attachment.



**ANNEXURE-A1**

**Undertaking to be given by the MSE Bidder for availing benefits/ exemptions as per PPP 2012 for cases where **Itemwise evaluation** is applicable**

M/s NTPC Limited

Ref: Our Bid Reference Number: \_\_\_\_\_ Dated \_\_\_\_\_  
against Tender Invitation  
Number \_\_\_\_\_ Dated \_\_\_\_\_ for \_\_\_\_\_ Name of  
Package \_\_\_\_\_

With reference to our bid (as referred above) against subject Tender Invitation, we have attached relevant documents for availing benefits/ exemptions available to MSEs as per PPP 2012 and its subsequent amendments, if any. We are aware that benefits to MSEs under PPP 2012 are available to manufacturer of goods and not to traders/dealers and accordingly, we hereby undertake that:

\* *We are **manufacturer of all the quoted item(s)** and understand that the benefits as applicable to MSEs under PPP 2012 including Purchase Preference shall be applicable as per provisions of Bidding Document for all the quoted items of our bid.*

*Or*

\* *We are **manufacturer of some the quoted item(s)** and understand that the benefits pertaining to EMD and Tender fee exemption shall be applicable for our bid as per provisions of Bidding Document. We also understand that Purchase Preference benefits as applicable to MSEs under PPP 2012 shall be applicable only for those quoted items of our bid for which we are a manufacturer and the remaining quoted items, for which we are not a manufacturer, shall not be eligible for the aforesaid Purchase Preference benefits as per provisions of Bidding documents.*

We also understand that in case documents submitted by us for availing benefits/exemptions applicable to MSEs under PPP 2012 are not found to be in order by NTPC Limited/ Employer at any stage of Bid Evaluation and EMD and/or cost of Bid Documents (wherever applicable) have also not been submitted by us then our bid shall not be considered further for evaluation and be rejected.

Thanking you,

(Authorized Signatory)



Name & address of the bidder \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date:

**\* Strike out which is not applicable**



### **EMD/BID SECURITY SUBMISSION**

(A) In case of Bidders opting for Bank Guarantee as Bid Security but unable to send the Original Bank Guarantee in physical form at the tender opening location, following shall be applicable:

The issuing bank shall intimate through their own official e-mail id to concerned C&M department with a copy to Bidder regarding issuance / extension of BG along with following documents:

- (a) The scanned copy of the BG.
- (b) SFMS message acknowledgement copy sent to NTPC banker stating the date of sending.
- (c) An undertaking through official e-mail id of bank as per format enclosed at Annexure-A below.

SFMS message must be sent to the Employer's bank whose details are:

|    |           |                            |
|----|-----------|----------------------------|
| i  | Bank Name | ICICI BANK LTD.            |
| ii | Branch    | Connaught Place, New Delhi |
| iv | IFSC Code | ICIC0000007                |

**Bidders shall be required to upload the scanned copy of the BG on GeM portal.**



## **Annexure -A**

### **Format of Undertaking (To be sent by Issuing Bank through official e-mail id)**

From: [xxxbank@xx.in](mailto:xxxbank@xx.in)

To: hemantkumar03@ntpc.co.in

We have issued BG No. .... dated ..... for an amount of Rs. .... on behalf of .....[Name of Bidder] towards Bid Security / EMD for Tender No. .... in favour of ..... [Name of Employer].

Please find enclosed the soft copy of the Bank Guarantee and SFMS acknowledgement. This SFMS is sent on ..... (date).

Any demand / claim made by the 'Employer' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder till the validity period mentioned in the Bank Guarantee.

However, in absence of the physical copy of aforementioned BG with the Employer, we undertake that Employer's demand / claim will be binding and conclusive on us without the physical copy of aforementioned BG till fourteen (14) days from the due date of submission of Techno-Commercial bids.

We undertake not to cancel the aforementioned BG No. .... without written consent / instruction from NTPC.

(Name of Bank Official)

Authority No.



**Annexure-IIA**

**Form of Insurance Surety Bond towards Bid Security  
(To be stamped in accordance with Stamp Act of India)**

Insurance Surety Bond No. ....  
Date.....

To  
[Employer's Name and Address]  
Dear Sirs,

In accordance with Invitation for Bids under your Bid Document No. ...., M/s.....[Bidder's Name]..... having its Registered/Head Office at ..... (hereinafter called the 'Bidder') wish to participate in the said bid for [Name of Package] ..... As an irrevocable Insurance Surety Bond against Bid Security for an amount of .....(\*) valid for.....days from .....(\*\*) required to be submitted by the Bidder as a condition precedent for participation in the said bid which amount is liable to be forfeited on the happening of any contingencies as mentioned under the Bidding Documents.

We, the.....[Name & address of the Insurer]..... having our Head Office at ..... (#) guarantee and undertake to pay immediately on demand by NTPC Limited (hereinafter called the 'Employer') the amount of..... (\*) without any reservation, protest, demand and recourse. Any such demand made by the 'Employer' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder and/or any right/remedy available to the bidder in terms thereof.

This Insurance Surety Bond shall be unconditional as well as irrevocable and shall remain valid upto .....(@) If any further extension of this Insurance Surety Bond is required, the same shall be extended to such required period (not exceeding one year) on receiving instructions from M/s .....[Bidder's Name]..... on whose behalf this Insurance Surety Bond is issued.

In witness where of the Insurer, through its authorised officer, has set its hand and stamp on this..... day of.....20.....at.....

.....  
(Signature)



.....  
(Name)  
.....  
(Designation with Insurer Stamp)  
Authorised Vide  
Power of Attorney No.....  
Date.....

NOTE: 1. (\*) The amount shall be as specified in the Bid Data Sheets.

(\*\*) This shall be the date of opening of Techno-Commercial bids.

(#) Complete mailing address of the Head Office of the Insurer to be given.

(@) This date shall be forty five (45) days after the last date for which the bid is valid.

2. The Insurance Surety Bond shall be from an Insurer as per guidelines issued by Insurance Regulatory and Development Authority of India (IRDAI) as amended from time to time.

3. The Employer shall be the Creditor, the Bidder shall be the Principal debtor and the Insurance company/Insurer shall be the Surety in respect of the Insurance Surety Bond to be issued by the Insurer.

4. The Insurance Surety Bond should be on Non-Judicial stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the state(s) where the Insurance Surety Bond is submitted or is to be acted upon or the rate prevailing in State where the Insurance Surety Bond is executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Bidder/Insurer issuing the Insurance Surety Bond.

5. While getting the Insurance Surety Bond issued, Bidders are required to ensure compliance to the points mentioned in Form of Bank Guarantee/Insurance Surety Bond Verification Check List enclosed in this Section of Bidding Documents. Further, Bidders are required to fill up this Form and enclose the same with the Insurance Surety Bond.



**ANNEXURE II**

**Undertaking from Independent Statutory Auditor**

**(On letter head digitally signed by a person duly authorized to Sign on behalf of the Statutory Auditor)**

**Bid Ref. No:**

**Date:**

To,  
NTPC Ltd.

---

**Subject: Authentication of veracity of documents submitted by M/s \_\_\_\_\_  
in support of meeting the Qualifying Requirements.**

Ref no. \_\_\_\_\_ : \_\_\_\_\_ IFB/Tender  
Name \_\_\_\_\_ of \_\_\_\_\_ the \_\_\_\_\_ Package/  
Tender: \_\_\_\_\_

Dear Sir,

M/s. \_\_\_\_\_ (hereinafter called Bidder) having Registered office at \_\_\_\_\_ intend to participate in above referred tender of NTPC Ltd.

We, M/s \_\_\_\_\_ has been appointed as Statutory Auditor for the Bidder i.e. M/s \_\_\_\_\_ (Relevant documents on our appointment attached)

The tender condition stipulates that the bidder shall submit supporting Documents pertaining to Technical Qualifying Requirement duly verified and certified by Statutory Auditor.

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.

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

1. Doc ref./PO No. no. \_\_\_\_\_ dated \_\_\_\_\_ (name \_\_\_\_\_ of Documents)
2. Doc ref./PO No. no. \_\_\_\_\_ dated \_\_\_\_\_ (name \_\_\_\_\_ of Documents)





3. Doc ref./PO No. no. \_\_\_\_\_ dated \_\_\_\_\_ (name of Documents)

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

\*Further, we have examined the books of accounts, records, and other relevant documents, along with other necessary information and explanations furnished by M/s \_\_\_\_\_ and hereby certify following:

\_\_\_\_\_

This certificate is issued at the request of M/s ..... (Bidder) for the purpose of participating in tender/s.



**Annexure III**

**Undertaking from Third Party Inspection Agency**

**(On letter head digitally signed by a person duly authorized to Sign on behalf of the TPIA)**

**Bid Ref. No:**

**Date:**

To,  
NTPC Ltd.

---

Dear Sir,

**Subject: Authentication of veracity of documents submitted by  
M/s \_\_\_\_\_ in  
support of meeting the Qualifying Requirements.**

Ref : IFB/Tender no. \_\_\_\_\_  
Name \_\_\_\_\_ of \_\_\_\_\_ the \_\_\_\_\_ Package/  
Tender: \_\_\_\_\_

M/s. \_\_\_\_\_ (here in after called Bidder) having Registered office  
at \_\_\_\_\_  
\_ intend to participate in above referred tender of NTPC Ltd.

The tender condition stipulates that the bidder shall submit supporting Documents pertaining to Qualifying Requirement duly verified and certified by a specified independent Third Party Inspection Agency as per the list mentioned in the bidding documents.

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.

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

1. Doc ref./PO No. no. \_\_\_\_\_ dated \_\_\_\_\_ (name \_\_\_\_\_ of \_\_\_\_\_ Documents)
2. Doc ref./PO No. no. \_\_\_\_\_ dated \_\_\_\_\_ (name \_\_\_\_\_ of \_\_\_\_\_ Documents)
3. Doc ref./PO No. no. \_\_\_\_\_ dated \_\_\_\_\_ (name \_\_\_\_\_ of \_\_\_\_\_ Documents)



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

We further confirm that we neither have any vested interest in aforesaid tender nor have any conflict of interest in respect of above tender.

This certificate is issued at the request of M/s \_\_\_\_\_ (Bidder) for the purpose of participating in the subject tender/s.

Thanking you,

*\* Strike off, whichever is not applicable.*



**Annexure 01**

**CERTIFICATE FOR  
COMPLIANCE TO  
ALL PROVISIONS OF BIDDING DOCUMENTS  
(Certificate of "NIL"  
Deviation)  
Towards COMPLIANT BID**

To  
AGM(CPG-1)  
Contracts & Materials  
NTPC Raipur

Dear Sir,

1. With reference to our Bid submitted against the tender, we hereby confirm that we comply with all terms, conditions and specifications of the Bidding Documents read in conjunction with Amendment(s) / Clarification(s) / Addenda/Errata (if any) issued by the Employer prior to opening of Techno Commercial Bids and the same has been taken into consideration while making our Techno Commercial Bid & Price Bid and we declare that we have not taken any deviation in this regard.

2. We understand that in case the Products and/or Services offered do not meet the Technical requirements, then our bid shall be rejected as Technically non responsive.

We also confirm that in case we refuse to withdraw additional conditions/deviations/variations/exception, implicit or explicit, found anywhere in the techno commercial bid, our bid shall be rejected as Technically non responsive.

We further confirm that if any deviation/variation in any form is found in our Price Bid, the EMD shall be forfeited.

Signature\_\_\_\_\_

Name & Designation\_\_\_\_\_

Name of Company\_\_\_\_\_

(Seal of Company)



**Annexure 12B**

**Proforma of Certificate from the CEO/CFO of the company in accordance with Financial requirement criteria in cases where audited results for the last financial year as on the date of Techno commercial bid opening are not available**

(To be submitted by Bidder along with the Techno commercial Bid with QR Documents)

To  
AGM(CPG-1)  
Contracts & Materials  
NTPC Raipur

Dear Sir,

1.0 I, Mr./Ms\_\_\_\_\_(\*CEO of the Company/\*CFO of the Company), confirm and undertake that the Financial results of the Company are under audit as on the date of Techno commercial bid opening and the Certificate from the practicing Chartered Accountant certifying the financial parameters is not available.

2.0 Accordingly, the company is not able to submit the Certificate from a practicing Chartered Accountant certifying its financial parameters for the last financial year and the audited results of the three consecutive financial years preceding the last financial year have been considered for meeting the financial parameters in the bid submitted by M/s \_\_\_\_\_(Name of the Bidder) for the \_\_\_\_\_(Name of the package) under GEM Bid number \_\_\_\_\_ Dated \_\_\_\_\_.

Signature\_\_\_\_\_

Name & Designation\_\_\_\_\_

Name of Company\_\_\_\_\_

(Seal of Company)



**EFT Form**

Dear Sirs,

We, hereby authorize the Employer to make all our payments through Electronic Fund Transfer System. The details for facilitating the payments are given below:

**(TO BE FILLED IN CAPITAL LETTERS)**

**1. NAME OF THE BENEFICIARY**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
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**2. ADDRESS**

|                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| <b>PIN CODE</b> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**3. TELEPHONE NO. (WITH STD CODE)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**4. BANK PARTICULARS**

**A) BANK NAME**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**B) BANK TELEPHONE NO. (WITH STD CODE)**

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**C) BRANCH ADDRESS**

|                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| <b>PIN CODE</b> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**D) BANK FAX NO (WITH STD CODE)**

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**E) BRANCH CODE**

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**F) 9 DIGIT MICR CODE OF THE BANK BRANCH (ENCLOSE COPY OF A CANCELLED CHEQUE)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**G) 11 DIGIT IFSC CODE OF THE BANK**

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**H) BANK ACCOUNT NUMBER**

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**I) BANK ACCOUNT TYPE (TICK ONE)**

|               |                |             |                    |               |
|---------------|----------------|-------------|--------------------|---------------|
| <b>SAVING</b> | <b>CURRENT</b> | <b>LOAN</b> | <b>CASH CREDIT</b> | <b>OTHERS</b> |
|---------------|----------------|-------------|--------------------|---------------|



IF OTHERS, SPECIFY

|  |  |  |  |  |  |  |  |  |  |
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5. PERMANENT ACCOUNT NUMBER (PAN)

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6. E-MAIL Address for Intimation regarding release of payments

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I/We hereby declare that the particulars given above are correct and complete. If the transaction is delayed or credit is not affected at all for reasons of incomplete or incorrect information, I/We would not hold the Employer responsible.

SIGNATURE

DATE

|  |  |  |  |  |  |
|--|--|--|--|--|--|
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(AUTHORISED SIGNATORY)

Name:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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OFFICIAL STAMP

**BANK CERTIFICATION:**

It is certified that above mentioned beneficiary holds a bank account \_\_\_\_\_ with our branch and the Bank particulars mentioned above are correct.

DATE

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

SIGNATURE

(AUTHORISED SIGNATORY)

Authorisation no.:

Name

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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Enclosure: Blank Cheque





To  
AGM(CPG-1)  
Contracts & Materials  
NTPC Raipur

**Details of PAN and GST**

Dear Sir,

The details of our registration in line with the various authorities are as under:

**(a) PAN number**

Our PAN number is as under:

|                                 |  |
|---------------------------------|--|
| <b>Permanent Account Number</b> |  |
|---------------------------------|--|

Note: Copy of card indicating PAN number duly attested by the bidder under his seal and signature to be submitted.

**(b) Goods & Services Tax number:**

Our **GSTIN** is

|                     |  |
|---------------------|--|
| <b>GSTIN Number</b> |  |
|---------------------|--|

Note : Copy of registration with up to amendment to be enclosed.

**PROFORMA OF BANK GUARANTEE FOR EARNEST MONEY DEPOSIT/  
BID SECURITY**

(To be stamped in accordance with Stamp Act)



Bank Guarantee No \_\_\_\_\_

Date :

To,  
NTPC Limited,

.....  
.....

Dear Sirs,

In accordance with your NIT No.....dated M/s .....(\*\*\*)  
..... having its registered/Head Office at .....  
(hereinafter called the 'Bidder') wish to participate in the said Bid for .....(name  
of package).

As an irrevocable Bank Guarantee against Earnest Money Deposit/Bid Security for an amount of .....  
(\* ) ..... valid for ..... days from ..... (\*\* )....., is required to be submitted by the Bidder  
as a condition precedent for participation in the said bid, which amount is liable to be forfeited on the  
happening of any contingencies mentioned in the Bidding Documents.

We, the ..... [Name and address of the Bank].....having our head  
office at ..... (#) ..... guarantee and undertake to pay immediately on demand by NTPC Ltd.  
(hereinafter called 'the Employer') the amount ..... (\*)..... (in figures  
and words) without any reservation, protest, demand and recourse. Any such demand made by the  
said 'Employer' shall be conclusive and binding on us irrespective of any dispute or difference raised  
by the Bidder.

This guarantee shall be irrevocable and shall remain valid up to ..... (@) If any further  
extension of this guarantee is required, the same shall be extended to such required period (not  
exceeding one year) on receiving instructions from M/s ..... [Bidders  
name].....on whose behalf guarantee is issued.

In witness whereof the Bank, through its authorized officer has set its hand and stamp on this  
..... Day .....20..... at .....

Signature.....  
Name.....  
Designation.....  
Bank's Common Seal.....  
Power of Attorney No.....

**Note:**

1. (\*) The amount shall be as specified in the NIT/Bidding Documents.  
(\*\*) Write the name and address of the Bidder  
(\*\*\*) This shall be the date of opening of bids.  
(#) Complete mailing address of the Head Office of the Bank to be given.  
(@) This date shall be forty five days beyond the validity of bid.



2. The Bank Guarantee shall be from a bank as per provisions of bidding documents.
3. The Stamp Paper of appropriate value shall be as per stamp act purchased in the name of the Bidder/Bank issuing the guarantee.
4. While getting the Bank Guarantee issued, Bidders are required to ensure compliance to the points mentioned in the Bank Guarantee Verification Check List in the bidding documents. Bidders are required to fill up this check List and enclose the same alongwith the Bank Guarantee.
5. The details of secure SFMS (in case of BGs issued from within India) or SWIFT (in case of BGs issued from outside India) sent by Bidder's Bank to Employer's Beneficiary Bank details of which are given in SPC must be furnished with the BG.

**PROFORMA OF BANK GUARANTEE FOR CONTRACT PERFORMANCE**

(To be stamped in accordance with Stamp Act)



Bank Guarantee No \_\_\_\_\_

Date :

To,  
NTPC Limited,

.....  
.....

Dear Sirs,

In consideration of the NTPC Ltd., (hereinafter referred to as the "Purchaser" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s..... with its registered Registered/ Head Office at.....(hereinafter referred to as the "Seller" which expression shall unless repugnant to the context or meaning thereof, includes its successors, administrators, executors & assigns) a Contract by issue of Purchaser's Purchase Order No.....dated and the same having been unequivocally accepted by the seller resulting in a 'Contract' valued at.....for..... (scope of work/contract) and the seller having agreed to provide a contract performance guarantee of the faithful performance of the entire contract equivalent to ten percent (10%) of the said value of the contract to the purchaser.

We,.....(Name & Address of Bank) .....having our Head Office at.....(hereinafter referred to as the 'Bank' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors & assigns), do hereby guarantee and undertake to pay the Purchaser, on demand any and all monies payable by the Seller to the extent of.....as aforesaid at any time up to.....(\*).....without any demur, reservation contest, recourse, or protest and/or without any reference to the Seller. Any such demand made by the Purchaser on the Bank shall be conclusive and binding notwithstanding any difference between the Purchaser and Seller or any dispute pending before any court Tribunal, Arbitrator or any other Authority. The bank undertakes not to revoke this guarantee during its currency without previous consent of the purchaser and further agrees that this guarantee herein contained shall continue to be enforceable till the purchaser discharges this guarantee.

The Purchaser shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from time to time to extend the time for performance of Contract by the Seller. The Purchaser shall have the fullest liberty, without affecting this guarantee to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Seller, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied in the contract between the Purchaser and the Seller or any other course of remedy or security available to the Purchaser. The Bank shall not be released of its obligations under these presents by any exercise by the Purchaser of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the purchaser or any other indulgence shown by the Purchaser or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the Bank.

The Bank also agrees that the purchaser at its option shall be entitled to enforce this guarantee against the bank as a principal debtor, in the first instance without proceeding against the seller and notwithstanding any security or other guarantee that the purchaser may have in relation to the seller's liabilities.



Notwithstanding anything contained hereinabove our liability under this guarantee is restricted to ..... and it shall remain in force up to and including.....(\*).....and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s.....on whose behalf this guarantee has been given.

Dated this .....day of ..... 20..... at .....

WITNESS

SIGNATURE\_\_\_\_\_

1.SIGNATURE:  
NAME  
OFFICIAL ADDRESS  
2. SIGNATURE  
NAME  
OFFICIAL ADDRESS

NAME\_\_\_\_\_  
DESIGNATION\_\_\_\_\_  
BANK'S COMMON SEAL  
ATTORNEY AS PER POWER  
OF ATTORNEY'S NUMBER  
DATE\_\_\_\_\_

**NOTE:**

- 1.(\*) The Date will be Three Months beyond the expiry of the warranty period as specified in the order.
- 2.The Bank Guarantee shall be from a bank as per provisions of bidding documents.
- 3.While getting the Bank Guarantee issued, Bidders are required to ensure compliance to the points mentioned in the Bank Guarantee Verification Check List in the bidding documents. Bidders are required to fill up this check List and enclose the same alongwith the Bank Guarantee.
- 4.The Stamp paper of appropriate value shall be purchased in the name of guarantee issuing bank or the party on whose behalf the BG is being issued. The Bank Guarantee shall be issued on non judicial Stamp paper of appropriate value as per Stamp act prevailing in the States where the BG is to be submitted or is to be acted upon or the rate prevailing in the state where the BG is executed, whichever is higher.
- 5.The details of secure SFMS (in case of BGs issued from within India) or SWIFT (in case of BGs issued from outside India) sent by Supplier's Bank to Employer's Beneficiary Bank details of which are given in SPC must be furnished with the BG.

..... PACKAGE  
FOR..... PROJECT BIDDING DOCUMENT NO.  
.....



**(Adherence to Employer’s Anti-Bribery and Anti-Corruption (ABAC) Policy)**

We and our employees along with our associate / collaborator/ subcontractors / sub vendors / consultants / service providers shall strictly abide by 'Anti-Bribery and Anti-Corruption (ABAC) Policy' of Employer as displayed on tender website at <https://ntpctender.ntpc.co.in/> under section 'policy docs' and undertake that we represent and confirm that we are aware of, understand, and will comply with all applicable laws and regulations relating to anti-corruption and anti-bribery and the ABAC Policy of Employer. In addition, each Party agrees that so long as it is conducting business with the other Party or the other Party’s affiliates, it will not, directly or indirectly, on behalf of the other Party or the other Party’s affiliates promise, offer, solicit, authorize, give or receive bribe, or other corrupt payment, item or service of value, or any other corrupt advantage, whether in cash or in kind, in relation to the participation in the tender.

**Annexure 12A**  
**Details pertaining to Technical Qualification of Bidder**

GEM Bid Number \_\_\_\_\_



To,  
 AGM(C&M)  
 CPG-1, NTPC Limited, Western Region II Headquarters, Plot No-87, Sector-24, Atal Nagar, Naya Raipur, Raipur Chhatisgarh

Dear Sirs,

To satisfy the qualifying requirements specified, we furnish following details in respect of Orders given at Attachment 12 above:

| Sl. | Particulars  | Order-1   | Order-2 | Order-3 |
|-----|--|---|---------|---------|
| 1.  | PO No./Contract/Work Order and Date  |   |         |         |
| 2.  | Client name and its address, fax no. & telephone no.(e-mail address)   |   |         |         |
| 3.  | Name & Designation of the responsible person in client's organization (e-mail address)   |   |         |         |
| 4.  | In order to qualify in any other case whether this purchase order was submitted earlier in NTPC (If yes)—Please fill the details | *-NIT No. of that case in which this order was submitted<br><br>-Name of the work/package<br><br>-Name of Dealing executive of that case<br><br>-Whether you were qualified bidder in that case | -----   | -----   |

**All the above mentioned documents are duly certified by Independent Statutory Auditor of our Company or specified Third-Party Inspection Agency (TPIA) as per bidding document and we have enclosed these documents with Annexure II or III.**

**Note A:**

- Continuation sheets of like size and format may be used as per the bidders requirement and shall be annexed to this schedule
- Bidder is required to attach necessary documents like copies of work order/purchase order, completion certificates, agreements etc. in support of the above.



**Note B:**

Bidder must submit all requisite documents duly certified and verified by independent statutory auditor of third party inspection agency (TPIA) in support of their meeting the QR including those detailed in the SPC. If the space in above table is insufficient, then bidder may please give data in another paper in the same format.

- i. The table is to be filled & the supporting documents are to be attached in the online offer.
- ii. The documents which can be given are: - PO copies+, Invoice Copies + LR Copies etc.
- iii. In case of providing any incorrect information / document(s) regarding the above Qualifying Requirements, it may result in suspension of business dealings (please refer clause 5.1 of our banning policy) and / or forfeiture of EMD, including intimation to NSIC or such authorities.
- iv. NTPC reserves the right to demand originals of submitted documents to be shown by the bidder for verification.

Date:  
Bidder

Signature of Authorized representative of

Place:

Name:  
Designation:  
Name of the Firm:





Annexure-C

**Policy for Debarment from Business Dealings**

**Policy for Debarment from Business Dealings (Rev-4 dated 05.05.2023)**



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|         | 4.2   | Procedure                 |
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|         | 4.4   | Area of Operation         |
|         | 4.5   | Effect of Withholding     |
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|         | 5.10  | Hosting at NTPC Website   |
|         | 5.11  | <b>-- Deleted --</b>      |
|         | 5.12  | Appeal                    |
|         | 5.13  | Revocation                |
| 6.      | Suspension of Business Dealings   |                           |
|         | 6.1   | Grounds                   |
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|         | 6.3   | Procedure                 |
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| 7.      | Participation of Agency under Different Name  |                           |
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| 9.      | Treatment in Tender/ Contracts of JVs/Subsidiaries of NTPC  |                           |



## Policy for

# Debarment from Business Dealings

### **1. Introduction**

- 1.1** NTPC Ltd. deals with Agencies, who are expected to adopt ethics of highest standards and a very high degree of integrity, transparency, commitments and sincerity towards the work undertaken. It is not in the interest of NTPC to deal with any Agency, which commits deception, fraud or other misconduct of whatsoever nature in the tendering process and/or execution. NTPC is committed for timely completion of the projects within the awarded value without compromising on quality.
- 1.2** Since banning of business dealings involves civil consequences for an Agency concerned, it is incumbent that adequate opportunity of hearing is provided and the explanation, if tendered, is considered before passing any order in this regard keeping in view the facts and circumstances of the case.

### **2. Scope**

- 2.1** NTPC reserves its right to withhold or ban or suspend business dealings with any Agency, if such Agency is found to have committed misconduct or any of its action(s) fall into any such categories as laid down in this policy.
- 2.2** The procedure for (i) Withholding of Business Dealings, (ii) Banning of Business Dealings and (iii) Suspension of Business Dealings with any Agency, has been laid down in these guidelines. The terms 'withholding', 'suspension', 'banning' etc. convey the same meaning as that of debarment.
- 2.3** This policy comes into force from the date of its issuance.
- 2.4** The provisions of this policy will be effective on investigations conducted or misconduct/irregularities noticed on the part of any Agency in all contracts awarded on or after the date of implementation of this policy and in the contracts under execution or contracts not yet closed, on the date of the implementation of this policy.
- 2.5** The provisions of this Policy shall be applicable for Subsidiaries/JVs of NTPC as well.
- 2.6** Withholding / Banning / Suspension of business dealings with any agency shall be done Company wide only (entire NTPC including Subsidiaries and JVs).

### 3. Definitions

In these Guidelines, unless the context otherwise requires:



i) **Agency** shall mean Contractor / Supplier / Applicant/ Purchaser / Bidder/ Seller/ Consultant/ Buyer/ NTPC approved Sub-contractor of a Contractor' to whom work has been awarded. It shall include, but not limited to, a public limited company or a private limited company, a firm whether registered or not, any individual, a cooperative society or an association or a group of persons engaged in any commerce, trade industry, or constituents of an unincorporated Joint Venture Company, Proprietor, Individual, Artificial Juridical person etc.

ii) **Competent Authority** shall mean the following :-

**a) For Banning of Business Dealings pertaining to Contracts awarded/processed from Corporate Centre/ Site/ Region/ USSC/JVs/Subsidiaries of NTPC**

Functional Director of the concerned deptt. initiating the proposal for Banning shall be the '**Competent Authority**' for the purpose of these guidelines.

For cases pertaining to JVs / Subsidiaries of NTPC, the **Competent Authority** shall be the Chairman of the Board of the JV / Subsidiary provided the Chairman is a Functional Director of NTPC. In case the Chairman of the Board of the JV / Subsidiary is not a Functional Director of NTPC, competent authority shall be Director-In-Charge of CC&M dept. of NTPC.


CMD (NTPC) shall be the '**Appellate Authority**' for all cases.

**b) For Withholding of Business Dealings pertaining to Contracts awarded/processed from:**

- (i) Corporate Centre - Concerned RED/Functional ED and ED(CC&M)
- (ii) Site/Region/USSC/JVs/Subsidiaries-Concerned RED and ED(USSC).

**c) For Suspension of Business Dealings including issuance of show cause notice for Banning pertaining to Contracts awarded/processed from:**

- (i) Corporate Centre – ED (CC&M)
- (ii) Site/Region/USSC/JVs/Subsidiaries – ED (USSC).

- iii) **'Investigating Department'** shall mean any Department or Unit of NTPC, investigating into the conduct of the Agency and shall include the NTPC Vigilance Department, Central Bureau of Investigation, the State Police or  any other department set up by the Central or State Government having powers to investigate.
- iv) **List of Enlisted Agencies** –shall mean and include list of Enlisted Parties / Contractors / Suppliers / Bidders etc.
- v) **State** – includes the Government and Parliament of India and the Government and the Legislature of each of the States and all local or other authorities within the territory of India or under the control of the Government of India.
- vi) **Fraud Prevention Policy** – shall mean the policy related to prevention of fraud displayed on NTPC tender website <https://ntpctender.ntpc.co.in>.
- vii) **Contractor Performance Feedback and Evaluation System** – The guidelines outlined in relevant NTPC circular for evaluating the Contractor's performance by the Screening Committee in respect of Contracts awarded by Corporate Contracts Services.
- viii) **Completion of Facilities** shall mean the term 'Completion of Facilities' as defined in the Contract.
- ix) **Standing Committee** shall mean a cross-functional Committee constituted for the purpose of these guidelines.
- x) **CC&M** shall mean "Corporate Contracts & Materials Deptt. of NTPC".
- xi) **Integrity Pact**- shall mean the pact as displayed on NTPC tender website <https://ntpctender.ntpc.co.in>.

#### 4. Withholding of Business Dealings

##### 4.1 Grounds

The business dealing with the Agency may be withheld, if they are found to be in breach of the terms & conditions of the Contract, on account of the reasons attributable to them, which shall include, but not be limited to the following:

If the Agency

- a) Either fails to commence work on the Facilities in terms of contract or suspends the progress of Contract performance;
- b) Fails to achieve the 'Completion of Facilities' or execute the contract milestones within time schedule stipulated in the contract;

- c) Suspends/stops work on any unfounded pretext including seeking higher compensation;



- d) Fails to conduct the Guarantee test in the time limit stipulated in the contract;
- e) Diverts funds advanced to the Contractor for purpose other than the Contract;
- f) Does not deploy or withdraws the technical staff or equipment considered necessary as per the terms & conditions of contract;
- g) Fails to furnish the required documents / information as required under the terms & conditions of contract;
- h) Does not fulfill the obligations as required under the Contract;
- i) Violates terms & conditions of the contract;
- j) Does not Supply material /supplies material of inferior quality with respect to Technical Specifications under the Contract;
- k) On prima-facie scrutiny, work executed found to be of poor quality beyond acceptable limits stipulated in the Technical Specifications under the Contract;
- l) If a disaster / major failure / accident / collapse of a structure/ system caused during erection or during defect liability period *prima facie* appears to be due to negligence of contractor or design deficiency or poor quality of execution;
- m) Assigns, transfers, sublets or attempts to assign, transfer or sublet the entire Works or any portion thereof without the prior written approval of the Employer;
- n) Misbehavior or physical manhandling by the Agency or his representative or any person acting on his behalf with any official of the company dealing with the concerned contract;
- o) If NTPC prima-facie is of the view that the Agency is guilty of an offence involving corrupt, fraudulent practices including misrepresentation of facts as per NTPC Fraud Prevention Policy, moral turpitude in relation to the business dealings with NTPC;
- p) If the Central Vigilance Commission, Central Bureau of Investigation or any other Central Government investigation Agency or any other Central Government Department recommends such a course in respect of a case under investigation;

- q) If the security consideration, including questions of loyalty of the Agency to the state, so warrants ;



The finished work either prematurely fails or fails to give the desired output/service during the defect liability period and the Agency fails to rectify it;

- s) On any ground as per which doing business dealings with the Agency is not in the public interest in the opinion of Competent Authority;
- t) If the Agency fails to comply with any of the statutory laws and regulations in force, in totality, even after completion of work;

#### **4.2 Procedure**

The concerned department at Site/Region/USSC/Corporate Centre on noticing any non/under performance and/or irregularities and/or misconduct and/or unethical practice as mentioned above, shall refer the matter to Convener of the Standing Committee along with relevant details. The Standing Committee shall analyze the referred case and if considered appropriate, shall put up the proposal for issuing Notice of Default for the purpose of withholding of business dealings with the Agency for approval of the Competent Authority. The above draft Notice of Default to be issued to the Agency should clearly indicate the charges based on the facts as can be proved.

In case the Standing Committee recommends waiver of withholding of business dealings with the Agency, the proposal along with reasons thereof shall be put up for approval of the CMD (NTPC).

#### **4.3 Notice of Default**

Once the proposal for issuance of Notice of default is approved by the Competent Authority, a 'Notice of Default' duly vetted by legal dept. shall be issued by the Competent Authority himself or by a person authorized for the said purpose to the Agency giving them a period of twenty eight (28) days to remedy the default.

If Agency fails to remedy or take adequate steps to remedy the default to the satisfaction of NTPC within the notice period mentioned above, then business dealings shall be withheld with the Agency after approval of the Competent Authority. The order of such withholding of business dealings (after vetting by legal dept.), shall be communicated by the Competent Authority himself or by a person authorized for the said purpose.

#### **4.4 Area of Operation**

Withholding of business dealings with any agency shall be done **Company-wide only** (entire NTPC including Subsidiaries and JVs), for all cases including cases processed from NTPC, Subsidiaries and JVs.

#### **4.5 Effect of Withholding**

The Agency, after issuance of the Order of Withholding of business dealings under this policy would not be allowed to participate in any future tender enquiry and if the Agency has already participated in another tender process and the price bids are not opened, its techno- commercial bid will be rejected and price bid will not be opened. Further, where the price bid of Agency has been opened prior to issuance of Withholding Order under this policy, the price bid of Agency shall be rejected. In case, such agency is the lowest evaluated bidder (L-1), next lowest evaluated bidder shall be considered as L-1.

No award shall be placed on any agency if Withholding Order for business dealings under this policy has been issued prior to award of contract.

Bid Security of such agency shall be returned after rejection of bids in these cases.

**Note-** Contracts concluded before the issue of the Withholding order shall, not be affected by the Withholding Order.

#### **4.6 Duration of Withholding**

Duration of withholding of business dealings with the Agency shall be **for a period of one year**. Within this period, if the Agency rectifies the reason / ground on which business dealings with the Agency has been withheld, to the satisfaction of the Competent Authority, then on written representation of the Agency, the Competent Authority can review and, if satisfied, may revoke the order of withholding of business dealing. Provided further that, even till completion of one year of withholding period, if the Agency does not rectify, then the Competent Authority after reviewing the situation may issue order extending the period of withholding for one more year or advise initiation of action for banning of business dealings with Agency in accordance with the procedure prescribed in Para 5.2 below.

#### **4.7 Revocation of Orders**

An order for withholding of business dealing passed for a certain specified period, including extension thereof, shall not be revoked automatically. Such withholding shall be revoked only after order in this respect is issued with the approval of Competent Authority.



## 5. Banning of Business Dealings

### 5.1 Grounds

Banning of business dealings can be initiated against Agency, on following grounds:

- a) If the Agency has abandoned or repudiated the Contract;
- b) If the Contractor is found to be non-performing in execution of contract by the Screening Committee (nominated as per NTPC established 'Contractor Performance Feedback and Evaluation System');
- c) If a disaster / major failure / accident / collapse of a structure / system is caused during erection or during defect liability period due to negligence of contractor or design deficiency or poor quality of execution under the contract;
- d) Misbehavior or physical manhandling by the Agency or his representative or any person acting on his behalf with any official of the Company dealing with the concerned contract is established;
- e) If the Director / Owner of the Agency, proprietor or partner of the Agency, is convicted by a court of law for offences involving corrupt and fraudulent practices including moral turpitude in relation to its business dealings with the government or NTPC or NTPC's group companies, during the last five years;
- f) If the proprietor of the Agency have been guilty of malpractices such as bribery, corruption, fraud, substitution of the tenders, interpolations, etc. in respect of participation in the bidding process for the contract and/or execution of the contract;
- g) If the Agency continuously refuses to return / refund the dues of NTPC or NTPC's group companies, without showing adequate reason and this is not due to any reasonable dispute which would attract proceedings in arbitration or court of Law;
- h) If the Agency employs a public servant dismissed / removed or employs a person convicted for an offence involving corruption or abetment of such offences ;
- i) If business dealings with the Agency have been banned by the Ministry of Power or Deptt. of Expenditure, Ministry of Finance and the ban is still in force;
- j) If it is established that Agency has resorted to corrupt, fraudulent practices including misrepresentation of facts in respect of participation in the bidding process for the contract and/or the execution of the contract;
- k) If the Agency uses intimidation/threatening or brings undue outside pressure on the NTPC or NTPC's group companies, or its official in acceptance / performance of the job under the contract;
- l) If the Agency indulges in repeated and / or deliberate use of delay tactics in complying with contractual stipulations;
- m) If the Agency is found to be involved in cartel formation during bidding for the tender;
- n) On willful indulgence by the Agency in supplying sub-standard material with respect to Technical Specifications under the Contract irrespective of whether pre-dispatch inspection was carried out by Company (NTPC) or not;
- o) Based on the findings of the investigation report of CBI/Police/or any other Central Government investigation Agency/Department against the Agency for mala-fide/unlawful acts or improper conduct on his part in matters relating to the Company (NTPC);



- p) If the Agency is declared bankrupt or insolvent or its financial position has become unsound, and in the case of a limited company, it is wound up or liquidated;
- q) Established litigant nature of the Agency to derive undue benefit;
- r) Continued poor performance of the Agency during execution under contracts pertaining to NTPC or its JV/Subsidiary companies;
- s) If the Agency violates Section-2 of the Integrity Pact provided in the bid/Contract;
- t) If the Agency commits fraud as defined under the Fraud Prevention Policy of NTPC;
  
- u) If the Agency has assigned or transferred the contract or engaged sub-contractor(s) without the prior approval of the Competent Authority in violation of the provisions of the contract;
  
- v) If the Agency misuses the premises or facilities of the NTPC forcefully occupies, tampers or damages the Company's properties including land, water resources, forests / trees, etc;
  
- w) If the security consideration, including questions of loyalty of the Agency to the state, so warrants;

**Note:** The examples given above are only illustrative and not exhaustive. The Competent Authority may decide to ban business dealing for any good and sufficient reason if it is established beyond any reasonable doubt.

## **5.2 Procedure**

The concerned department on noticing any non/under performance and/or irregularities and/or misconduct and/or unethical practice as mentioned above, shall refer the matter to Convener of the Standing Committee along with relevant details. The Standing Committee shall analyze the referred case and if considered appropriate, shall put up the proposal for issuing Show Cause Notice for the purpose of banning of business dealings with the Agency for approval of the Competent Authority.

In case the Standing Committee recommends waiver of banning of business dealings with the Agency, the proposal along with reasons thereof shall be put up for approval of CMD (NTPC).

Besides the Standing Committee, Vigilance Department / Screening Committee (under Contractor Performance Feedback and Evaluation System) may also be competent to initiate the proposal for banning.

## **5.3 Show Cause Notice**

Once the proposal for issuance of Show Cause Notice is approved by the Competent Authority, a 'Show Cause Notice' duly vetted by legal department shall be issued to the delinquent Agency, by the Competent Authority himself or by a person authorized for the said purpose.



The Agency shall be asked to submit the reply of Show Cause Notice within 15 days of its issuance. Further, the Agency shall be given an opportunity for Oral hearing with Standing Committee to present its case in person, if it so desires, and the date for Oral Hearing shall be necessarily indicated in the Show Cause Notice.

The purpose of issuing the Show Cause Notice is only that the Agencies concerned shall be given an opportunity to explain their stand before any action is taken. All that is required in such cases is that the grounds on which action is proposed to be taken shall be disclosed to the Agency inviting representation and after considering that representation, orders may be passed. Such orders require only the subjective satisfaction of the authority that passed the final orders.

If the Agency requests for inspection of any relevant document in possession of NTPC, necessary facility for inspection of documents may be provided.

During the conductance of oral hearing, only the regular employees of Agency will be permitted to represent the Agency and no outsider shall be allowed to represent the Agency on its behalf.

Reply to the Show Cause Notice given by the Agency and their submissions in oral hearing, if any, will be processed by the Standing Committee for obtaining final decision of the Competent Authority in the matter.

In case, no reply to Show Cause Notice is received from the Agency within stipulated time, action for processing ex-parte against the concerned Agency shall be initiated.

#### ***5.4 Speaking Order***

The speaking order shall be issued by the Competent Authority himself or by a person authorized for the said purpose.

#### ***5.5 Communication to Agencies***

The decision regarding banning of business dealings taken after the issue of a Show Cause Notice and consideration of representation, if any, in reply thereto, shall be communicated to the Agency concerned along with a reasoned order. The fact that the representation has been considered shall invariably be mentioned in the communication. Also the fact that if no reply was received to the Show Cause Notice shall invariably be indicated in the final communication to the Agency.

#### ***5.6 Period of banning***

The period for which the ban would be operative shall be mentioned in the order. The banning shall normally be for a period of six (6) months to two (02) years



from the date of issuance of the speaking order. The period of banning shall be recommended by the standing committee on case to case basis depending upon the gravity of the default of the agency except in cases of bribery, corrupt, and fraudulent practices including misrepresentation of facts, where the banning period shall be for two (02) years.

However, in cases processed under provisions of Integrity pact or Contractor Performance Feedback and Evaluation System, the banning would be operative for a period as specified therein.

In case the information/documents submitted by Agency in competing for the tender is found to be false/forged then NTPC, without prejudice to any other rights or remedies it may possess, shall recover from Agency the cost incurred in carrying out physical assessment for establishing veracity of such information/documents. In case Agency refuses to reimburse such cost to NTPC then banning period of Agency shall be extended by another one year.

Notwithstanding para 5.1(a) above, in case an agency after having been issued the Notification of Award / Letter of Award within the bid validity period, either “does not sign the Contract Agreement” or “does not submit an acceptable Performance Security”, business dealings with the agency shall be suspended for a period of six (06) months from the date of issuance of suspension order, in accordance with the procedure for suspension of business dealings as specified at para 6 of this Policy. However, in case the agency commits aforesaid transgression/default again in another tender of NTPC within three (03) years from the date of issuance of suspension order, business dealings with the agency shall be banned for a period of two (02) years from the date of issuance of speaking order.

### **5.7 Area of Operation**

Banning of business dealings with any agency shall be done **Company-wide only** (entire NTPC including Subsidiaries and JVs), for all cases including cases processed from NTPC, Subsidiaries and JVs).

### **5.8 Effect of Banning**

The Agency, after issuance of the Order of Banning of business dealings under this policy would not be allowed to participate in any future tender enquiry and if the Agency has already participated in another tender process and the price bids are not opened, its techno- commercial bid will be rejected and price bid will not be opened. Further, where the price bid of Agency has been opened prior to issuance of Banning Order under this policy, the price bid of Agency shall be rejected. In case, such agency is the lowest evaluated bidder (L-1), next lowest evaluated bidder shall be considered as L-1.

No award shall be placed on any agency if Banning Order for business dealings under this policy has been issued prior to award of contract.



Bid Security of such agency shall be returned after rejection of bids in these cases.

**Note-** Contracts concluded before the issue of the Banning order shall, not be affected by the Banning Order.

### **5.9 Process of reply**

The Agency shall be separately advised of the decision taken regarding banning of business dealings, in reply to their representation, if any. As regards any further representation from the Agency, business dealings with whom have been banned, the same shall be processed by the concerned C&M department in consultation with Vigilance department, wherever applicable. If any reply is considered necessary to be sent to the Agency, the same shall be sent by the concerned C&M department.

### **5.10 Hosting at NTPC website**

The names of the Agencies with whom Business Dealings have been banned shall be hosted at NTPC website by CC&M.

### **5.11 Deleted**

### **5.12 Appeal against the Decision of the Competent Authority.**

The Agency may file an appeal against the order of the Competent Authority for banning of business dealings before Appellate Authority. Such an appeal shall be preferred within one month from the date of receipt of the order of banning of business dealing. Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the Agency as well as the Competent Authority.

### **5.13 Revocation of Orders**

- a) The banning under 'Contractor Performance Feedback and Evaluation System' shall not be revoked automatically. Such banning shall be revoked only after re-evaluation of the performance of the Agency by the Screening Committee as detailed under the 'Contractor Performance Feedback and Evaluation System'.
- b) In all other cases, an order for banning issued for a certain specified period shall be deemed to have been automatically revoked on the expiry of that specified period and it will not be necessary to issue a specific formal orders of revocation, except that an order of banning passed on account of doubtful loyalty or security consideration shall continue to remain in force until it is specifically revoked.
- c) An order for banning issued for the reasons mentioned under para 5.1 above, may be revoked with the approval of the Appellate Authority, if, in respect of the same facts, the direction/order/judgement of a Court of Law envisages revocation of banning.

Further, an order for banning issued for the reasons mentioned at para 5.1 (e) above may be revoked with the approval of the Appellate Authority, if, in respect of the same facts, the accused has been wholly exonerated by a Court of Law.

## **6. Suspension of Business Dealings**

### **6.1 Grounds**

The suspension of business dealings can be initiated against Agency, on following grounds:

- a) If fraud by agency has been established. The definition of fraud shall be as defined under the 'Fraud Prevention Policy' of NTPC / Bidding documents for a tender.
- b) If the agency has abandoned or repudiated the contract or fails to sign the Contract Agreement or fails to submit an acceptable Performance Security.

### **6.2 Deleted**

### **6.3 Procedure**

#### **6.3.1 In cases of fraud**

- a) The concerned C&M deptt. shall put up the proposal for "Suspension of business dealings" and "issuance of Show Cause Notice" for banning of business dealings with the Agency for approval of the Competent Authority. After approval of Competent Authority, Suspension Order and Show Cause Notice shall be issued which must include the following:
  - i) the Agency is put on suspension list.
  - ii) why action should not be taken for banning the Agency for future business dealings.

The case shall be further processed for banning of business dealings with the Agency as per para 5 above.

- b) Suspension of business dealings with any agency shall be done Company-wide (entire NTPC including Subsidiaries and JVs), for all cases including cases processed from NTPC, Subsidiaries and JVs.
- c) The Suspension Order would operate initially for a period of not more than six (06) months. The recommendation for banning the Agency shall be concluded within the period of suspension. In exceptional circumstances, period of suspension can be further extended with the approval of the Competent Authority maximum up to three (03) months pending a conclusive decision to put the Agency on banning list. Also, a communication for extension of suspension period by three months shall be communicated to the Agency during the subsistence of suspension order of Six (06) months, failing which the suspension order shall stand revoked.

- d) Show Cause Notice for banning & Suspension order shall be issued by Competent Authority himself or by a person authorized for the said purpose.
- e) The names of the Agencies with whom Business Dealings have been suspended shall be hosted at intranet of CC&M. During the period of suspension, no new business dealing shall be held with the Agency.
- f) Period of suspension shall be accounted for in the final order passed for banning of business dealings with the Agency.
- g) If it is decided not to ban the Agency after due process, the name of the Agency shall be removed immediately from the suspension list.
- h) The suspension of Agency shall be automatically revoked on the expiry of the period of suspension.

**6.3.2 In cases of abandonment or repudiation of contract (except failure to sign the Contract Agreement or submit an acceptable Performance Security)**

- a) The concerned C&M deptt. shall put up the proposal for “Suspension of business dealings” and “issuance of Show Cause Notice” for banning of business dealings with the Agency for approval of the Competent Authority. After approval of Competent Authority, Suspension Order and Show Cause Notice shall be issued which must include the following:
  - i) the Agency is put on suspension list
  - ii) why action should not be taken for banning the Agency for future business dealings.

The case shall be further processed for banning of business dealings with the Agency as per para 5 above.

- b) Suspension of business dealings with any agency shall be done Company-wide (entire NTPC including Subsidiaries and JVs), for all cases including cases processed from NTPC, Subsidiaries and JVs.
- c) The Suspension Order would operate initially for a period of not more than six (06) months. The recommendation for banning the Agency shall be concluded within the period of suspension. In exceptional circumstances, period of suspension can be further extended with the approval of the Competent Authority maximum up to three (03) months pending a conclusive decision to put the Agency on banning list. Also, a communication for extension of suspension period by three months shall be communicated to the Agency during the subsistence of suspension order of Six (06) months, failing which the suspension order shall stand revoked.
- d) Show Cause Notice for banning & Suspension order shall be issued by Competent Authority himself or by a person authorized for the said purpose.



- e) The names of the Agencies with whom Business Dealings have been suspended shall be hosted at intranet of CC&M. During the period of suspension, no new business dealing shall be held with the Agency.
- f) Period of suspension shall be accounted for in the final order passed for banning of business dealings with the Agency.
- g) If it is decided not to ban the Agency after due process, the name of the Agency shall be removed immediately from the suspension list.
- h) The suspension of Agency shall be automatically revoked on the expiry of the period of suspension.

### **6.3.3 In cases of failure to sign the Contract Agreement or failure to submit an acceptable Performance Security**

- a) The concerned C&M dept. shall put up the proposal for "Suspension of business dealings" with the Agency for approval of the Competent Authority. After approval of Competent Authority, Suspension Order shall be issued which must include the following:
  - i) the Agency is put on suspension list
  - ii) in case the agency commits aforesaid transgression/default again in another tender of NTPC within three (03) years from the date of issuance of suspension order, business dealings with the agency shall be banned for a period of two (02) years from the date of issuance of speaking order for banning.

In case the agency commits aforesaid transgression/default again in another tender of NTPC within three (03) years from the date of issuance of suspension order, process for banning of business dealings with the Agency shall be initiated as mentioned at para 5.6 above.

- b) Suspension of business dealings with any agency shall be done Company-wide (entire NTPC including Subsidiaries and JVs), for all cases including cases processed from NTPC, Subsidiaries and JVs.
- c) The Suspension Order would operate for a period of six (06) months and is to be communicated to Agency.
- d) Suspension order shall be issued by Competent Authority himself or by a person authorized for the said purpose.
- e) The names of the Agencies with whom Business Dealings have been suspended shall be hosted at intranet of CC&M. During the period of suspension, no new business dealing shall be held with the Agency.
- f) The suspension of Agency shall be automatically revoked on the expiry of the period of suspension.



#### **6.4 Effect of Suspension:**

The Agency, after issuance of the Order of Suspension of business dealings under this policy would not be allowed to participate in any future tender enquiry and if the Agency has already participated in another tender process and the price bids are not opened, its techno- commercial bid will be rejected and price bid will not be opened. Further, where the price bid of Agency has been opened prior to issuance of Suspension Order under this policy, the price bid of Agency shall be rejected. In case, such agency is the lowest evaluated bidder (L-1), next lowest evaluated bidder shall be considered as L-1.

Further, in case such agency is the lowest evaluated bidder (L-1) and award recommendation on such agency has been put up for approval, or the award recommendation is approved prior to issuance of Suspension Order under this policy but award is yet to be placed, then award recommendation on such agency shall stand cancelled and the price bid of Agency shall be rejected. A revised recommendation has to be put up for approval considering next lowest evaluated bidder as L-1.

No award shall be placed on any agency if Suspension Order for business dealings under this policy has been issued prior to award of contract.

Bid Security of such agency shall be returned after rejection of bids in these cases.

**Note-** Contracts concluded before the issue of the Suspension Order shall, not be affected by the Suspension Order.

7. During the banning / withholding / suspension period, if it is found at any stage that Agency has participated in tender enquiry under a different name then such Agency would immediately be debarred from the tender/contract and its Bid Security/Performance Security would be forfeited. Payment, if any, made shall also be recovered.
8. Further in case of banning / withholding / suspension following would also be applicable:

#### **(i) Participation of Agency as an Associate/Collaborator of the Main Contractor**

The Agency, after issuance of the Order of Withholding/Banning/ Suspension of business dealings under this policy would not be allowed to participate as Associate/Collaborator of any bidders. In case the agency is proposed as Associate/Collaborator by any of the bidder and the price bids are not opened, its techno-commercial bid will be rejected and price bid will not be opened. Further, where the price bid of bidder has been opened prior to issuance of Withholding/Banning/Suspension Order under this policy, the price bid shall be rejected. In case, such bidder is the lowest evaluated bidder (L-1), next lowest evaluated bidder shall be considered as L-1.

Further, in case such bidder is the lowest evaluated bidder (L-1) and where award recommendation on such bidder has been put up for approval, or the award recommendation is approved prior to issuance of Withholding/Banning/ Suspension Order under this policy but award is yet to be placed, then award recommendation on such bidder shall stand cancelled and the price bid of bidder



shall be rejected. A revised recommendation has to be put up for approval considering next lowest evaluated bidder as L-1.

Bid Security of such bidder shall be returned after rejection of bids in these cases.

**(ii) Participation of Agency as an approved Sub-Vendor of the Main Contractor**

After banning/ withholding/ suspension order, the banned/ withheld/ suspended Agency shall not be allowed to participate as Sub-Vendor in the tenders for supplying/manufacturing equipment (s)/component (s)/service if it has been banned on grounds of supplying sub-standard material / equipment / service.

Further, if the banned/withheld/suspended agency is an approved Sub- vendor under any Contract for such equipment/component/service, the Main Contractor shall not be permitted to place work order/Purchase order/Contract on the banned/withheld/suspended agency as a sub- vendor after the date of banning/withholding/suspension even though the name of the party has been approved as a sub-vendor earlier.

**(iii) Procurement of spares/awarding of Contracts in operating stations**

There would be no bar on procuring the spares and awarding Contracts towards Annual Maintenance (AMC)/ O&M/ Repair works on Agencies pertaining to the packages for which business dealings have been withheld/banned/suspended with them provided the original Equipment has been supplied/manufactured by such Agency.

## **9. Treatment in Tender/ Contracts of JVs/Subsidiaries of NTPC**

**(i) Tenders/Contracts of JVs/Subsidiaries, whose Pre-award and/or Post award activities are handled by NTPC Corporate Centre**

The Tenders/Contracts of JVs/Subsidiaries, whose pre-award and/or post award activities are handled by NTPC Corporate Centre, the cases of non/under performance and/or irregularities and/or misconduct and/or unethical practice observed in such tenders/contracts may be processed in NTPC under the Policy and Procedure for Debarment from business dealings and/or Contractor Performance Feedback and Evaluation System. The Notice of Default or Order for Withholding of business dealings (under Para 4.3) / Show Cause Notice or Speaking Order for banning of business dealings (under Para 5.3, 5.4) / Suspension order for suspension of Business Dealings (Under para 6.3), after approval in NTPC, shall be forwarded to CEO of concerned JVs / Subsidiaries for issuance of such Notice or Order to the delinquent agency.



Further, the appeal of the Agency against the above Order (under Para 5.12) shall be reviewed by Appellate Authority in NTPC. Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the Agency as well as the Competent Authority and CEO of concerned JVs/Subsidiaries.

**(ii) *The Tenders/Contracts which are handled by JVs/Subsidiaries themselves***

The procedure prescribed in the Policy shall appropriately be used by concerned JVs/Subsidiaries to deal with the cases of non/under performance and/or irregularities and/or misconduct and/or unethical practice observed in tenders/contracts handled by them.



## Appendix-I to Annexure-C

### Compliance to NTPC “Policy for Debarment from Business Dealing”

Bidders shall certify their compliance on "Policy for Debarment from Business Dealings " of Employer by accepting the following.

**“Do you certify full compliance to all provisions of Bid Doc?”**

(1) Bidder has read the contents of Debarment Policy displayed on the website [www.ntpc.co.in/www.ntpc.tender.ntpc.co.in](http://www.ntpc.co.in/www.ntpc.tender.ntpc.co.in) and agreed to abide by this policy.

- a) Bidder has not been Banned / Blacklisted as on date of submission of bid by Ministry of Power or Deptt. Of Expenditure, Ministry of Finance.
- b) Bidder has not employed any public servant dismissed / removed or person convicted for an offence involving corruption or abetment of such offences.
- c) Bidder’s Director(s) / Owner(s) / Proprietor / Partner(s) have not been convicted by any court of law for offences involving corrupt and fraudulent practices including moral turpitude in relation to business dealings with Government of India or NTPC or NTPC's group companies during the last five years.

(2) Bidder further confirms as under:

that if at any point subsequent to award of Contract, the declarations given above are found to be incorrect, NTPC / Employer shall have the full right to terminate the Contract and take any action as per applicable laws for breach of contract including forfeiture of Bid Security/Performance Bank Guarantee.



**Appendix-A**

**CERTIFICATE FOR COMPLIANCE OF THE PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA) 'PPP-MII' ORDER**

\*It is hereby certified that all the guidelines circulated by NTPC in pursuance of Public Procurement (Preference to Make in India) 'PPP-MII' Orders of DPIIT/MoP have been complied with in tender No. **GEM/2023/B/3546561** for "Procurement of Tower & Cassette AC-Bulk".

Or

\*It is hereby certified that tender No. .... for ..... (Name of Tendered Work) ..... falls under the exempted category of tender as per the guidelines circulated by NTPC in pursuance of Public Procurement (Preference to Make in India) 'PPP-MII' Orders issued by DPIIT / MoP.

Or

\*It is hereby certified that tender No. .... for ..... (Name of Tendered Work)....., pertains to goods/services/works for which exemption in Minimum local content requirement has been granted by MoP (or concerned Authority) vide OM / Letter No. @..... dated..... Accordingly, all the guidelines circulated by NTPC in pursuance of Public Procurement (Preference to Make in India) 'PPPMII' Orders issued by DPIIT/MoP, except those related to MLC requirement, have been complied with for the subject tender.

**@ relevant OM / Letter issued by MoP (or concerned authority) granting exemption in Minimum Local Content may be mentioned**

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

(Signature)  
Concerned C&M Coordinator  
(not below the level of DGM)



## Summary of Details &amp; Documents in Support of QR

(To be submitted in Envelope 2 with Techno-commercial Bid)

To,

Central Procurement Group-1

NTPC Limited

Raipur, Chhattisgarh

.....

In order to meet the Qualifying Requirement of NIT, we submit as under duly certified and verified documents in addition to other required documents as per clauses of QR:

| Sl.   | QR Stipulation   | Brief Details along with Supporting Document |  |   |                                  |                                 |                           |
|-------|--|--|--|---|----------------------------------|---------------------------------|---------------------------|
|       |  | Name of Client<br>(Name and address)         | LOA/ Contract/<br>Purchase Order<br>no. and date | Award Value of<br>LOA/ Contract/<br>Purchase Order<br>(Rs.) | Client<br>Certificate<br>details | Value of work<br>executed (Rs.) | Period<br>of<br>execution |
| 1.1.1 | The bidder should be a 'manufacturer of 'Diesel Electric Tower Wagon/Car for Over Head Electrification Maintenance'. |  |  |   |                                  |                                 |                           |



|       |   |  |  |  |  |  |  |
|-------|---|--|--|--|--|--|--|
| 1.1.2 | The bidder should have executed the order(s) for supply of 'Diesel Electric Tower Wagon/Car for OHE Maintenance' during the preceding seven (07) years prior to date of Techno-commercial bid opening in any of the following manner: |  |  |  |  |  |  |
|       | <p><b>(i) One (1) order having executed value not less than Rs. 693 Lakhs in a single order.</b></p> <p style="text-align: center;"><b>OR</b></p>   |  |  |  |  |  |  |
|       | <p><b>(ii) Two (2) orders having executed value not less than Rs. 433 Lakhs two orders each.</b></p> <p style="text-align: center;"><b>OR</b></p>   |  |  |  |  |  |  |
|       | <p><b>(iii) Three (3) orders having executed value not less than Rs. 346 Lakhs three orders each.</b></p>   |  |  |  |  |  |  |



|    |   |     |                                    |                         |  |  |  |
|----|---|-----|------------------------------------|-------------------------|--|--|--|
|    |   |     |                                    |                         |  |  |  |
|    | 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           |     |                                    |                         |  |  |  |
| 2. | 1.2 The Average Annual Turnover of the Bidder, should not be less than <b>Rs. 866 Lakhs (Rupees Eight crore sixty-six Lakhs Only)</b> during the preceding three (3) completed financial years as on the date of Techno-Commercial bid opening. | FY: | Turnover:                          | Average Annual Turnover |  |  |  |
|    |   | FY: | Turnover:                          |                         |  |  |  |
|    |   | FY: | Turnover:                          |                         |  |  |  |
|    | List of supporting documents submitted<br>(Copies of relevant purchase orders along with proof of execution such as corresponding excise invoice/ delivery challans, LR, installation/ performance report etc)<br>1.<br>2.<br>3.                |     |                                    |                         |  |  |  |
|    | All the above mentioned documents are duly certified by Independent Statutory Auditor of our Company or specified Third-Party Inspection Agency (TPIA) as per bidding document and we have enclosed these documents with Annexure II or III.    |     |                                    |                         |  |  |  |
|    |   |     | Signature of Bidder Representative |                         |  |  |  |







