



OWNER:
THE TATA POWER COMPANY LIMITED

TITLE OF WORK TO BE AWARDED:

**SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF VRF AIR CONDITIONING
SYSTEM AT SECOND FLOOR OFFICE, STATION A BUILDING, TROMBAY THERMAL POWER
STATION, CHEMBUR, MUMBAI**

ENQUIRY REFERENCE NO.: CC27PMR014

NOTICE INVITING EXPRESSION OF INTEREST (EOI) FOR

SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF VRF AIR CONDITIONING SYSTEM AT SECOND FLOOR OFFICE, STATION A BUILDING, TROMBAY THERMAL POWER STATION, CHEMBUR, MUMBAI

Enquiry reference no.: CC27PMR014
Title of Work: Supply, Installation, Testing and Commissioning of VRF Air Conditioning System at Second Floor Office, Station A Building, Trombay Thermal Power Station, Chembur, Mumbai
Type of Bidding: E-tendering (through Ariba online portal) / Two Part (Technical and Price bids under separate envelopes)
Contact Details: All communication including EOI submission shall be addressed to following officer/s: Mr. Prasad Redij Email: prasad.redij@tatapower.com Copy of all communications shall be marked to (Cc): Ms. Yogita Waman Email: yogita.waman@tatapower.com Mr. P Ramrayka Email: p.ramrayka@tatapower.com

The Tata Power Company Limited ("Owner") invites Expression of Interest (EOI) from interested parties for the Two-Part e-Tendering Process of following Relevant Work Package:

Table 1

Package Description	Tender Fee	Bid Security	Estimated package value	Last date and time for Payment of Tender Participation Fee	Last date and time for bid submission
Supply, Installation, Testing and Commissioning of VRF Air Conditioning System at Second Floor Office, Station A Building, Trombay Thermal Power Station, Chembur, Mumbai	INR 2000/- (INR Two Thousand Only) <i>To be submitted along with EOI.</i>	INR 75,000 (INR Seventy Five Thousand only). <i>Bid Security to be submitted as a Guarantee/ DD/ NEFT at the BID stage (and not with EOI)</i>	INR 75 Lakhs (INR Seventy Five Lakhs) approx.	12th September 2026, CoB.	23 rd September 2026, 1700 Hrs Any changes/ extensions shall be intimated through Ariba online portal to vendors who have purchased the tender.

- Interested bidders are strongly advised not to wait by above time and purchase the tender immediately to get the link for bid submission. This will enable them to communicate/raise queries against the subject tender in time.

1. INTRODUCTION:

The Tata Power Company Limited (TPC) is among the largest private sector Power Utility companies in India with presence in Generation, Transmission and Distribution of Power through conventional and renewable sources.

The tendering/ procurement activities for this Package are being managed from Tata Power's following office

Smart Center of Procurement Excellence (SCOPE),
Corporate Contracts,
The Tata Power Company Limited,
2nd Floor, Sahar Receiving Station, Near Hotel Leela,
Sahar Airport Road, Andheri East, Mumbai – 400 059, Maharashtra, India.

2. SCOPE OF WORK:

Brief scope includes design, manufacturing, supply, loading/unloading, installation, testing and commissioning of VRF AC system at Second Floor Office, Station A Building, Trombay Thermal Power Station, Chembur, Mumbai.

Detailed Scope of Work and BOQ/ Price schedule is attached as Volume F & I in this NIT document, respectively.

3. TENDER FEE & TIMELINES:

a) Interested parties meeting the "Bidder Pre-Qualification Requirements" specified under point no. 4 in this document can request tender document and participate in the bidding process by submitting the Expression of Interest (EOI) Letter along with the Tender Fee Payment Details to the contact details mentioned below not later than deadline specified below. Request for extension of EOI submission date will be not entertained.

b) Interested bidders should submit the Expression of Interest (EOI) letter and tender fee payment details to below mentioned email addresses:

- Mails shall be addressed to (To): prasad.redij@tatapower.com
- Must mark copy to (cc): yogita.waman@tatapower.com; p.ramrayka@tatapower.com

EOI / requests without complete information and communication as above within deadline shall be liable to be rejected and will not be considered further.

c) Tender Fee, as indicated in the Table1 above may be paid through **NEFT/RTGS** as per details for payment of Tender Fee given in Table2 below:

Table 2

Details for payment of Tender Fee:	
Bank details for submitting Tender fees through bank transfer / NEFT:	Beneficiary Name: The Tata Power Company Limited Bank Name: HDFC Bank A/c no: 00600110000763 IFS Code: HDFC0000060 A/c type: CC Branch Name & Address: HDFC Bank, Maneckji Wadia Building, Nanik Motwani Marg, Fort, Mumbai 400023
Deadline for tender fee payment and submission of EOI:	12th September 2026, CoB.
Deadline for submission of bid in ARIBA and EMD:	23rd September 2026, 1700 HRS Any changes/ extensions shall be intimated through Ariba online portal to vendors who have purchased the tender.

d) Expression of Interest letter to be submitted along with tender fee payment details should include the following details:

- A covering letter duly stamped and signed by an authorized signatory clearly indicating the Tender Reference number and your EOI to participate in the tendering process.
- Tender fee payment details / reference no (ensure that tender fee is received by us within specified deadline)
- Bidder to indicate authorized person name, contact number and e-mail id (mandatory) of the person to whom RFQ / tender and all other communications to be addressed for this tender.

e) Interested bidders to submit Tender Participation Fee and Authorization Letter before Last date and time as indicated above after which link from Tata Power E-Tender system (Ariba) will be shared for further communication and bid submission.

4. BIDDER PRE-QUALIFICATION REQUIREMENTS:

Interested parties to note that Bidder shall be required to fulfill the following bidder pre-qualification requirement / criteria to qualify for the subject work. Bidder will be required to submit relevant supporting documents to demonstrate their qualification during the bid submission stage against Tender document / RFQ and bidders not found meeting the pre-qualification requirements given below will be disqualified from the tender.

4.1 TECHNICAL REQUIREMENT:

4.1.1. Bidder should have successfully executed similar works of VRF/VRV air conditioning systems in Industrial and Commercial setup in any of last 5 (Five) years as follows:

1 (One) contract of minimum value Rs. 1 (One) Crore **OR**

2 (Two) contracts of minimum value Rs. 60 (Sixty) Lakhs each

(Attach Purchase Order copies, Certificate of Experience and Satisfactory Completion of work awarded from concerned Establishments / Companies)

Similar Work Definition: - Supply, Installation, Testing & Commissioning (SITC) of VRF/VRV air conditioning systems including ODUs, Indoor Units, AHUs/TFA integration, refrigerant piping, controls and associated HVAC works in Industrial and Commercial setup.

4.1.2. Bidder / Tenderer should preferably have ISO 9001, ISO 14001 and OHSAS 18001/ ISO 45001 certification or must give an undertaking for its willingness to obtain the same within 2 months of qualification for the work.

4.2 FINANCIAL REQUIREMENT:

4.2.1 Bidder / Tenderer should have minimum Average Annual Turn-over of Rs. 2 Crores (Indian Rupees Two Crores only) in the preceding 3 years. **(Attach Certificates from Chartered Accountant in this regard)**

It may be noted that the above requirements are minimum qualification criteria. However, Tata Power reserves its right to further assess the capabilities of the parties and reserves its rights to further shortlist, accept or reject any party without assigning any reason. The tender may be split in more than one parties at the discretion of Owner.

5. BID SECURITY / EMD:

Interested parties to note that Bidder will be required to furnish a Bid Security along with their Bid, in the format prescribed in Bid Document **in the form of Bank Guarantee or through RTGS or Demand Draft**, for an amount as defined in the covering page of this notice document. Bids not accompanied by an acceptable Bid Security shall be rejected by the Owner as being non-responsive and returned to the bidder without being opened.

Interested parties to note that Bid Security is not required with the EOI and it is required to be submitted with the Bid only during Bid Submission stage once RFQ is released to the interested parties that have submitted a valid EOI.

6. BIDDING PROCESS:

Detailed Bid Document (also referred as RFQ) shall be issued through Tata Power e-tender portal (Ariba System) only to the parties that submitted a valid EOI as per terms mentioned in this document.

Bidder to note that commercials for subject tender may be conducted through e-auction. Detailed bidding and auction process shall be detailed in the RFQ / tender document.

CONTENTS OF THE ENQUIRY

Following Documents Form Part of Tender Enquiry:

- A. Tender notice including Instruction to Bidders (This document)
- B. Format for Submission of Bank Guarantee for EMD/ Bid security
- C. Agreed Terms and Conditions
- D. Format for Pre bid queries/ deviations
- E. Techno-Commercial Pre-Qualification Requirement
- F. Technical Specifications
- G. Safety bid document
- H. Special Conditions of Contract
- I. Price Schedule
- J. General Conditions of Contract (GCC)
 - J.1 GCC- Supply
 - J.2 GCC- Services
- K. Tata Power Policies/ Statutory Guidelines
 - K.1 Safety Terms and Condition- R6
 - K.2 Environment Policy
 - K.3 Health and Safety Policy
 - K.4 TCOC
 - K.5 Vendor Declaration Compliances

Enquiry Ref No.: CC27PMR014	THE TATA POWER COMPANY LIMITED	Volume I A
	SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF VRF AIR CONDITIONING SYSTEM AT SECOND FLOOR OFFICE, STATION A BUILDING, TROMBAY THERMAL POWER STATION, CHEMBUR, MUMBAI	SHEET 1 of 4
	INSTRUCTIONS TO BIDDER (TWO PART BID)	

The Tata Power Company Limited (TPCL) invites bid for **"Supply, Installation, Testing and Commissioning of VRF Air Conditioning System at Second Floor Office, Station A Building, Trombay Thermal Power Station, Chembur, Mumbai"**

1. The bid package is issued in the name of Bidder and is non-transferable.
2. Bidder shall acknowledge the receipt of the tender within two (2) working days from the Date of issue of this Request for Quotation (RFQ)/enquiry.
3. Bidders shall review the entire tender document (including technical documents) and ensure the given objectives expected herein can be achieved or the technical requirements can be met in totality. Any deviation or substitution must be highlighted on a separate document.
4. Bidder must carefully go through all commercial conditions of contract before quoting the price. Any exceptions pertaining to clauses affecting prices or costs either way must be clearly stated.
5. Any deviation taken by Bidder may lead to rejection of the bid.
6. Bidder shall quote a firm price and shall be bound to keep this price firm without any escalation for any reason whatsoever until they complete Service against the tender.
7. Bidder shall give clear break-up of the basic price and the taxes and duties included in the price quoted.
8. The quantities mentioned in the tender are liable for change.
9. TPCL reserves the right to accept or reject any or all bids or cancel/ withdraw the RFQ without assigning any reason whatsoever. In such an event, no claim shall be made arising out of such action.
10. Any time prior to the deadline for submission of Bid, TPCL may for any reasons, whether at their own initiative or in response to clarifications requested by Bidders, modify the enquiry including specification by amendment. The amendment will be notified in writing to all qualified Bidders to whom the RFQ has been issued and will be binding on them. The Bidder shall acknowledge the receipt of the amendment promptly upon the receipt of the same. In order to afford Bidders time in preparing of Bid due to amendment, TPCL may, at its discretion, extend the deadline set for submission of the Bid.
11. TPCL will not be liable for any expenses whatsoever incurred by the Bidder for the preparation, submission and opening of bids
12. This specification consists of two (2) volumes;
 - 12.1. **Volume – I**
 13. A-Instruction to bidders (ITB), B- Special Conditions of Contract, C1- General Terms and Conditions – Supply, C2- General Terms and Conditions – Supply, D-Agreed terms and Conditions (ATC), E- Format for submission of deviations, F1-Environment- F2-Health & Safety F3-Sustainability, F4-Safety terms & Conditions, F5-Tata Code Of Conduct.

12.2 **Volume – II**

A- Technical Specifications

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	INSTRUCTIONS TO BIDDER (TWO PART BID)	

14. Submission of Offer

Two bid system: Bidder shall submit complete bid including list of deviations if any to the Scope of Work and the terms & conditions of the RFQ if any as well as furnish all required and relevant enclosures and submit the same in **submit/upload the same in Ariba system as per the guidelines:**

- I. Techno-Commercial Bid (Un-priced Bid)
- II. Price Bid

15. Kindly, note that the Technical Bid shall contain Volume I- **B,F** and Volume II-**A** has to be signed and stamped. Volume I- **D,E** to be duly filled, signed & stamped. Above mentioned documents to be submitted with all the supporting document as per Pre-Qualification Requirements (PQR).

16. Kindly note that offers submitted with price details in technical bid are liable for rejection.

17. The bidder shall sign, its proposal with the exact names of the entity to which the contract is to be awarded. Each page of the bid shall be duly signed and sealed by an authorized officer of the bidder's organization.

18. The bid must be kept valid for **180** days from the date of opening of the bids. In exceptional circumstances TPCL may solicit the bidder's consent to an extension of the period of validity.

19. Bidders are advised to submit their bid well in time.

20. Bidders are advised to submit their bid well in time i. e. on or before bid submission date and time. Request for extension of Bid submission date will not be entertained.

21. Engineer Details for technical queries/ site visit:-

21.1 Technical queries: Mr. Piyush Dixit (Mobile: 9029002819, EMAIL: piyush.dixit@tatapower.com)

21.2 Site Visit: Mr. Ashish Pandey (Mobile: 9029008159, EMAIL: ashish.pandey@tatapower.com)

Submission of Pre bid queries	16.09.2026 till 5PM
Pre - bid clarification meeting & Site visit	To be decided
Due date and time for submission of bids	23.09.2026 till 5PM

22. Evaluation Criteria:

22.1. The bids will be evaluated technically on the compliance to tender terms and conditions, scope compliance etc.

22.2. The bids will be evaluated commercially on lowest total contract price basis as per Price Schedule. Hence, all bidders are advised to quote their most competitive offer.

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	INSTRUCTIONS TO BIDDER (TWO PART BID)	

23. Bid Opening & Evaluation Process:

23.1. Process to be Confidential:

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence the TPCL processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

23.2. Technical Bid Opening:

Technical Bid of all valid Bids shall be opened simultaneously.

23.3. Preliminary Examination of Bids/ Responsiveness:

TPCL will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order. TPCL may ask for submission of original documents to verify the documents submitted in support of qualification criteria.

Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.

Prior to the detailed evaluation, TPCL will determine the substantial responsiveness of each Bid to the Bidding Documents including capability of providing the Goods/Services and acceptable quality of the Goods / Services offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

Bid determined as not substantially responsive will be rejected by TPCL and may not subsequently be made responsive by the Bidder by correction of the non-conformity

23.4. Techno Commercial Clarifications:

Bidders need to ensure that the bids submitted by them are complete in all respects to assist in the examination, evaluation and comparison of Bids, TPCL may, at its discretion, ask the Bidder for a clarification on its Bid for any deviations with respect to the TPCL specifications and attempt will be made to bring all bids on a common footing. All responses to requests for clarification shall be in writing

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	INSTRUCTIONS TO BIDDER (TWO PART BID)	

only. Where applicable, Safety Bid shall also be evaluated along with technical bid for the qualification of Bidders against their safety systems & practices and past safety records.

23.5. Price Bid Opening:

Bidders may be asked to submit revised Price Bid in case there is any material change agreed by TPCL during technical evaluation / clarifications. Price Bid of only Technically and / or Safety Qualified Bidders shall be considered and opened.

24. Reverse Auctions:

TPCL reserves the right to go for Reverse Auction (RA) for price negotiation and discover the most competitive price on its e-sourcing portal. This will be decided after techno-commercial evaluation of the bids. Bidders need to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case TPCL decides to go for RA.

Only those Bidder who are techno-commercially qualified & have submitted valid Price Bids shall be eligible to participate further in RA process. However, H1 Bidder (whose price bid is the highest post techno-commercial evaluation) shall not be allowed to participate in further RA process provided minimum three techno-commercially qualified bids are available.

FORMAT OF EMD – Bid Guarantee BG

Note: a) Format shall be followed in toto

b) Claim period of six months must be kept. In case of Bank is not ready to give BG for six months and claim period of six months EMD BG valid of one year to be given

c) The guarantee to be accompanied by the covering letter from the bank confirming the signatories to the guarantee on the Bank's letter head.

The Tata Power Co Ltd
34, Sant Tukaram Road
Carnac Bunder,
Mumbai 400 009

Whereas (Name of the Contractor), a Company incorporated under the Indian Companies Act 1956, having its Registered office at _____, (hereinafter called the "BIDDER") has in response to your Invitation to Bid against Enquiry No. _____ dated _____, for (name of work), offered to supply and/or execute the works as contained in Employers letter dated _____.

AND WHEREAS BIDDER is required to furnish to you a Bank Guarantee for the sum of Rs. _____/-(Rupees ____ only) as Earnest Money against Bidder's offer as aforesaid.

AND WHEREAS we, (name of the bank) having our Registered Office at _____ and Branch office at _____, have at the request of Bidder, agreed to give you this Guarantee as hereinafter contained.

NOW THEREFORE, in lieu of earnest money deposit, we, the undersigned, hereby covenant that the aforesaid Bid of the BIDDER shall remain open for acceptance by you during the period of validity as mentioned in the Bid Document or any extension thereof as requested by you and if Bidder shall for any reason back out, whether expressly or impliedly, from this said Bid during the period of its validity or any extension thereof as aforesaid, we hereby guarantee to you the payment of the sum of Rs. _____/-(Rupees ____ only) on demand and without demur and notwithstanding the existence of any dispute between you and the BIDDER in this regard and we hereby further agree as follows:

- (a) You shall have the right to file/make a claim on us under the Guarantee for a further period of six months from the said date of expiry.
- (b) That this guarantee shall not be revoked during its currency without your written express consent.
- (c) That you may without affecting this guarantee grant time or other indulgence to or negotiate further with BIDDER in regard to the conditions contained in the said Bid document and thereby modify these conditions or add thereto any further conditions as may be mutually agreed upon between you and BIDDER.
- (d) That the guarantee hereinbefore contained shall not be affected by any change in the constitution of our Bank or in the constitution of BIDDER.

- (e) That any account settled between you and BIDDER shall be conclusive evidence against us of the amount due hereunder and shall not be questioned by us.
- (f) That this guarantee commences from the date hereof and shall remain in force till BIDDER, if his Bid is accepted by you, furnishes the Contract Performance Guarantee as required under the said specifications and executes formal Contract Agreement as therein provided or till ____Days (__days) from the date of submission of the Bid by the BIDDER i.e. (expiry date), whichever is earlier.
- (g) That the expression, BIDDER and Bank, and OWNER herein used shall, unless such an interpretation is repugnant to the subject or context, include their respective successors and assignees.
- (h) Notwithstanding anything herein contained, our liability under this guarantee is limited to Rs._____/-(Rupees _____only) and the Guarantee will remain in force upto and including and shall be extended from time to time for such period or periods as may be desired by you. Unless a demand or claim under this Guarantee is received by us in writing within six months from (expiry date), i.e. on or before (claim period date), we shall be discharged from all liabilities under this guarantee thereafter.
- (i) Any claim/extension under the guarantee can be lodgeable at issuing outstation bank or at Mumbai branch and claim will also be payable at Mumbai Branch. **(To be confirmed by Mumbai Branch by a letter to that effect)**

Notwithstanding anything contained hereinabove :

- a) Our liability under this Bank Guarantee shall not exceed Rs._____/-(Rupees _____ only).
- b) This Bank Guarantee shall be valid upto ----- 200.
- c) Our Liability to make payment shall arise and we are liable to pay the guaranteed amount or any part there of under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before ----- 200.

VOLUME ID

AGREED TERMS & CONDITIONS (ATC)

Bidder's Name: M/s. _____

RFQ ref. No. _____

Enquiry Description: _____

Bidder's Offer Ref.: _____

1. SUBMISSION OF THIS DOCUMENT DULY SIGNED, SHALL CONSTRUCT THAT ALL THE CLAUSES OF AGREED TERMS AND CONDITIONS HAVE BEEN ACCEPTED BY YOU. PURCHASE ORDER, IF ANY, SHALL BE GOVERNED BY THE CONFIRMATION PROVIDED HERE.

Sr. No.	Description	BIDDER'S RESPONSE
A	<u>TECHNICAL (If applicable)</u>	
1	Acceptance of technical specifications including General/Technical notes and scope of supply/work as per Tender specification In case of deviation, confirm that the same has been furnished separately.	
2	Confirm data sheets duly filled in have been submitted, wherever required as requested in Technical specification	
B	<u>COMMERCIAL</u>	
3	Bid Validity As per Annexure - Special Conditions of Contract	
4	Firm price: Quoted prices shall remain firm and fixed till complete execution of the order.	
5	Taxes: GST: Any other tax as applicable:	
6	Completion/Delivery Period : As per Annexure - Special Conditions of Contract	
7	Payment Terms Acceptance: As per Annexure - Special Conditions of Contract	
8	Contract Performance Bank Guarantee: As per Annexure - Special Conditions of Contract	
9	Liquidated Damages (LD):- As per Annexure - Special Conditions of Contract	
10	Service Level Agreement (SLA):- As per Annexure - Special Conditions of Contract	
11	Compliance to other terms & conditions Acceptance of all other terms & conditions as forming the Part of the RFQ/ Tender document and communicated vide subsequent addendum(s) if any: In case of deviation, confirm that the same has been furnished separately.	

*Bidders/ Vendor shall note that in case of any contradiction between the Agreed Terms and Conditions (ATC) ; Bidder offer and the Bidders offer , the ATC shall prevail.

Bidder's Authorised Signatory
Name:



Package Name:

Technical Specification No:

Bidder's Name:

Subject: Technical Deviation sheet by Bidder

[illegible]

**Package Name:**

Technical Specification No:

Bidder's Name:

Subject: Commercial Deviation sheet by Bidder

[illegible]

PRE-QUALIFICATION REQUIREMENT (PQR)

TECHNICAL REQUIREMENT:

1. Bidder should have successfully executed similar works of VRF/VRV air conditioning systems in Industrial and Commercial setup in any of last 5 (Five) years as follows:

1 (One) contract of minimum value Rs. 1 (One) Crore **OR**

2 (Two) contracts of minimum value Rs. 60 (Sixty) Lakhs each

(Attach Purchase Order copies, Certificate of Experience and Satisfactory Completion of work awarded from concerned Establishments / Companies)

Similar Work Definition: - Supply, Installation, Testing & Commissioning (SITC) of VRF/VRV air conditioning systems including ODUs, Indoor Units, AHUs/TFA integration, refrigerant piping, controls and associated HVAC works in Industrial and Commercial setup.

2. Bidder / Tenderer should preferably have ISO 9001, ISO 14001 and OHSAS 18001/ ISO 45001 certification or must give an undertaking for its willingness to obtain the same within 2 months of qualification for the work.

FINANCIAL REQUIREMENT:

1. Bidder / Tenderer should have minimum Average Annual Turn-over of Rs. 2 Crores (Indian Rupees Two Crores only) in the preceding 3 years. **(Attach Certificates from Chartered Accountant in this regard)**

It may be noted that the above requirements are minimum qualification criteria. However, Tata Power reserves its right to further assess the capabilities of the parties and reserves its rights to further shortlist, accept or reject any party without assigning any reason. The tender may be split in more than one parties at the discretion of Owner.

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THE TATA POWER COMPANY LIMITED

**Technical Specification of HVAC system
for
President Generation Office Second Floor**

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1. INTRODUCTION

This specification has been prepared for HVAC System with supply, erection, testing and commissioning of HVAC System along with all its accessories.

2. BIDDER'S QUALIFYING REQUIREMENTS

- 2.1 Owner's preferred list of vendor / sub vendor / OEM is shared as part of Technical Specifications. However, if Bidder introduces additional vendor/sub vendor the same will be evaluated separately. This vendor/sub vendor evaluation / assessment shall inter-alia include (i) document verification; (ii) Bidders work / manufacturing facilities visit (iii) manufacturing capacity, details of works executed, works in hand, anticipated in future and the balance capacity available for present scope of works; (iv) details of plant and machinery, manufacturing and testing facilities, manpower and financial resources; (v) details of quality systems in place; (vi) past experience and performance; (vii) customer feedback; (viii) response to complaint. HVAC, bidder must meet all following qualifying criteria:
- 2.2 The bidder shall have carried out design, engineering, manufacturing, supply and supervision of installation, testing and commissioning of type tested products for a minimum 5 projects having min capacity of 50TR and above. The system supplied should have been in satisfactory commercial operation for a minimum period of 05 years as on scheduled date of the bid opening. Bidder to provide necessary reference documents along with bid.
- 2.3 In case the bidder has a previous association with Tata Power for similar products and services, the performance feedback for that bidder by Tata Power shall only be considered irrespective of performance certificates issued by any other organization.
- 2.4 From amongst the above projects, minimum 3 projects should have been in commercial operation for minimum period of 2 years.
- 2.5 Bidder must be OEM or channel partner of AC machine manufacturer, having manufacturing and testing facility in India. In case of channel partner, the bidder must share the Manufactures Authorization certificate specific to this tender.
- 2.6 The bidder shall confirm that design, manufacturing process and service support of offered equipment in Indian facility are identical to that in Bidder's parent factory without any change and approved by the parent.
- 2.7 Bidder must have support service Centre in India to cater after sales services.
- 2.8 Bidder shall agree to comply with minimum quality requirements and Contractor Safety Code of Conduct, defined in bid documents.
- 2.9 All offered equipment should have been successfully type tested at any of the internationally accredited laboratories in line with relevant standards. The bidder shall submit the Type test certificate of respective equipment and shall not be more than 5 years old.

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3. DESIGN REQUIREMENTS

3.1 Air conditioning areas

- a. Workstations, Cubicles
- b. Cabins, Meeting rooms
- c. Board room
- d. Server Room
- e. Lobby

TABLE-1

Air Conditioning design conditions					
Area	Temperature to be maintained Deg C	Pressure	Equipment type	Equipment configuration	Filtration
Workstation, Cubicles	24 ± 2	Minimum 5 PA positive pressure	VRF Cassette (4 way) + TFA	NW	Coarse filter
Cabins	24 ± 2		VRF Cassette (1 way) + TFA	NW	Coarse filter
Board room & meeting rooms	24 ± 2		VRF Cassette (4 way) + TFA	NW	Coarse filter
Server room	22 ± 2		VRF Hi-wall	1W + 1 S	Coarse filter

- 3.2 All outdoor units shall be designed to operate at an ambient temperature of 40°C. The capacities provided in the BOQ are based on 40°C ambient conditions. Therefore, equipment selection must ensure the required capacity after applying derating at 40°C.
- 3.3 Air conditioning system shall maintain required temperature and 55 % +/- 5 % humidity control in Air conditioning rooms. Please refer project information sheet for outside conditions. Bidder shall submit complete cooling load calculations for summer, monsoon and winter for all the air- conditioned areas, in support of the equipment capacities offered by him. Bidder to consider 10% design margin over the cooling load calculations. Bidder to design the AC plant as per the tonnage requirement based on heat load calculations. HVAC vendor shall submit complete cooling load calculations for summer, monsoon and winter for all the air-conditioned areas, In support of the equipment capacities offered by them. They should also include solar and transmission radiation through walls, glasses, roof, etc.
- 3.4 Occupancy level, heat gain from occupancy, heat gain from lighting, equipments, overall heat transfer co - efficient (U - value) for walls, roofs, floors, partitions, ceilings, windows etc. shall be as per latest ASHRAE standards based on the information furnished in air conditioning system cooling load design data.
- 3.5 Fresh air unit to be provided through TFA (treated fresh air unit) with DX coil & Oval ducting.
- 3.6 Equipment heat dissipation to be considered as per OEM recommendation.

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- 3.7 Required design safety margin on duct leakage, duct heat gain, piping heat gain to be considered 5%. and safety factor: 10.0% on total heat load need to be taken.
- 3.8 Fan heat gain to be considered 100% of total fan power consumption in heat load calculation.
- 3.9 Coil Bypass factor (CBF) shall be 0.12.
- 3.10 For air conditioned areas, fresh air would be provided 5 Cfm per person and 0.06 cfm per ft² in line with ASHRAE-62, whichever is higher.
- 3.11 Ventilation Areas
- Pantry
 - Toilet

TABLE-2

Ventilation areas design conditions						
Area	Temperature to be maintained Deg C	Air change	Pressure	Equipment configuration	Equipment type	Filtration for fresh air
Pantry	NA	10	Minimum 5 PA Negative	In line Exhaust fan	Exhaust air fan/ Fresh air Louver	G4
Toilet	NA	10	Minimum 5 PA Negative	In line Exhaust fan	Exhaust air fan/ Fresh air Louver	NA

- 3.12 Bidder to provide ventilation calculations for all areas as per ACPH
- 3.13 Bidder to select final capacity considering the max flow derived on ACPH
- 3.14 The design of the HVAC system shall comply with green building compliance requirement. Any other room not mentioned here but included in building layout shall be provided with required Air Conditioning/Ventilation system.
- 3.15 Noise and Vibrations
- The design of air conditioning and ventilation equipment and accessories shall ensure maintaining of noise and vibration levels within the limits as per latest applicable codes and standards.
 - Vibration isolators of proven design shall be furnished by the Contractor for preventing transmission of vibrations from the equipment to the other neighbouring equipment and structures.
 - The noise level inside the AC & ventilation area shall conform to NC 40 Characteristics.

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d. Noise level of outdoor equipment to be restricted to 75 dbA @ 1 m distance.

3.16 Air distribution system

3.17 The air-distribution ducting for air-conditioning system shall be sized based on equal friction method to have an initial velocity not exceeding 8m/sec (7.5 m/s for packaged A/C system) and friction rate not exceeding 0.8 pa/m. Grills exit air velocity should not exceed 2 m/s.

3.18 Supply Air ducting for AC system shall be designed based on Equal friction method at a friction rate of 0.8Pa/m and maximum initial velocity of 8.0m/s.

3.19 Return Air ducting for AC system shall be designed based on Equal friction method at a friction rate of 0.66Pa/m and maximum initial velocity of 8.0m/s.

3.20 The air-distribution ducting for Ventilation system shall be sized based on equal friction method to have an initial velocity not exceeding 11m/sec and friction rate not exceeding 0.8pa/m.

3.21 For Ducts, Aspect ratio shall not exceed 1:4.

3.22 Louver to be sized at velocity not exceeding 1.5 m/s.

3.23 Velocity across filters shall not be more than 2.3 m/s (Prefilter/Fine filter).

3.24 Fan static pressure to be selected considering filter in 50% chock condition.

Note: The above outlines the minimum design requirements for HVAC. The vendor shall ensure that design shall be done in accordance with relevant standards and site condition.

4. SYSTEM DESCRIPTION AND SCOPE

4.1 SYSTEM DESCRIPTION

- a. Selection of Air conditioning units based on the derived capacity.
- b. Outdoor air cooled condensing unit shall be selected at 40 Deg C ambient temperature. Capacity mentioned in BOQ to be delivered at 40 Deg C. Any de-rating required for the same to be considered in equipment offered. To be installed on the proper location on the buildings. Outdoor unit to be provided with epoxy coated MS stand.
- c. Indoor VRF units to be provided with trap doors for the areas having plain false ceiling. All ductable, Cassette units to be provided with drain pump.
- d. Suitable size Insulated refrigerant piping with protective covering. Refrigerant Piping to be routed on perforated cable tray. Cable tray shall be covered with GI sheet. Cable tray colour should be provided as per interior requirement. Refrigerant piping to be provided with refnet joints at all tapping.
- e. All cassette unit color should be provided as per interior requirement. And to be approved from client before order placement.

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- f. Fresh air duct color should be as per interior requirement and to be confirmed from client before installation work.
- g. Insulated UPVC/CS drain pipe (minimum 9mm insulation) with protective covering. Drain pipe to be routed to nearest drain point.
- h. Insulated GSS ducting, duct supports, duct insulation shall be 19mm for inside and 25mm insulation for outside duct with glass cloth cladding for inside ducting, 26G GI cladding for outside ducting.
- i. All supply air grilles/diffusers with damper and return air Grilles/Diffusers without damper.
- j. Motorized Fire damper to be provided for all ducts crossing walls/Slab.
- k. Insulated SS panel below ceiling suspended units (if any) for collecting drain. This drain to be connected to nearest drain sump.
- l. The underside of exposed roof of all air-conditioned areas will be insulated by 50 mm thick standard material.
- m. The air conditioning & Ventilation system shall be designed for 24 hours operation continuously.
- n. Damper to be provided at each branch for air balancing/controlling purpose.
- o. Real time based sequential panel, timer control with auto change over between units shall be provided for AC equipment so that one by one machine will come in operation for set time duration. In case of failure of one machine, next machine will come in operation. In case of additional load, additional AC machine next in the sequence will also come in operation.
- p. Bidder to consider interface with the fire detection system in his scope. Motorized fire damper for closing the supply & return air duct and also switching off AC machines on actuation of fire alarm system is required. Vendor to interlock and provide cable from fire panel up to motorized dampers and also up to AC machines.
- q. Necessary controllers & sensors such as thermostats, humidistat and safety thermostats in order to maintain inside design conditions.
- r. All fresh air/exhaust air fan to be provided with SS304 insect screen and GI cowl piece.
- s. All fresh air/exhaust louvers to be provided with SS304 insect screen and GI damper.
- t. Fresh air louvers to be provided with pre-Filter.
- u. Trap doors to be provided for fans installed above plain false ceiling.
- v. All supply air grilles/diffusers with damper and exhaust air Grilles/Diffusers without damper.
- w. All suspended axial fan and fresh units to be provided with vibration isolators.

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- x. All cabinet type exhaust air unit to be provided with vibration isolator between fan and unit base frame
- y. All DX & VRF system with power cum control panel and temperature sensors. Also internal control wiring, electrical cabling.
- z. Single power feeder shall be provided to HVAC panel further electrical distribution to each HVAC equipment shall be scope of HVAC vendor along with required panel and local MCBs, DBs, sockets.
- aa. All motors in Battery room shall be explosion proof motor and be painted with anti corrosive paint. Fan of Battery room shall be spark proof. All fans, ducting and grilles in battery area shall be given acid fume resistant anti-corrosive paint.
- bb. The system shall be integrated and installed and commissioned as a complete operational package to the satisfaction of owner.
- cc. The design of the HVAC system shall comply with green building compliance requirement. Any other room not mentioned here but included in building layout shall be provided with required Air Conditioning/Ventilation system.
- dd. All refrigerants used in AC system shall be CFC free only. No deviations accepted.
- ee. All Fans, Blowers etc. shall be interlocked with FDA such that when fire occurs the system in the particular area/adjacent areas is immediately switched off.
- ff. All ducting shall be zinc coated with 200 gsm and above.

4.2 SCOPE OF WORK

- a. Complete design, engineering, manufacture / fabrication, assembly, painting, inspection, testing, Factory testing & Material certificates, guarantee, documentation, packing and preservation, supply and shipment, storage on site, installation, testing commissioning, validation & Handing over of all equipment's, Electrical / control system & ancillary items with related relevant accessories is part of scope of work.
- b. Electrical starter panel for HVAC system along with cable, cable tray, local push button and necessary supports is HVAC vendor scope.
- c. Instrument control panel for HVAC system along with controller, wiring, cable tray and necessary supports HVAC vendor scope.
- d. HVAC vendor shall submit complete cooling and heating load calculations for summer, monsoon and winter for all the air-conditioned areas, In support of the equipment capacities offered by them.
- e. HVAC vendor to submit all ventilation calculation considering equipment heat dissipation and for battery room based on hydrogen emission.

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- f. HVAC vendor to submit stair case pressurization calculations or consideration.
- g. HVAC vendor to submit single line air flow diagram, electrical power supply drawing and P&ID of HVAC system.
- h. Working drawings like Air flow diagram, PID, Ducting Layout with sections, elevations, Equipment with Refrigerant Piping Layout with sections, electrical layout & As-built drawings shall be created by the contractor.
- i. HVAC vendor to submit detailed HVAC layout with actual equipment GAD, duct routing, pipe routing, cable routing, supports, section views, elevation views.
- j. Providing and fixing at site all equipment associated with Air Conditioning system listed under the technical specifications.
- k. Bidder is advised to visit the site before bidding so as to understand the actual site requirement and site constraints.
- l. To execute all incidental work at site including materials supply at site associated with Air Conditioning systems indicated in the Technical specifications.
- m. Any other item not mentioned in this specification, BOQ, description of item/system but required to complete that item/system will be in the scope of work of contractor.
- n. The packaged type AC system should be provided with proper air distribution system including supply/return air ducting, supports, accessories, etc. to ensure smart and uniform air flow and digital thermometers throughout the room.
- o. Performance testing at site of complete Air Conditioning system as per various technical requirements as stipulated in performance testing clause.
- p. The Air Conditioning/ventilation systems' Contractor's scope of work shall include all items of work as per these specifications, drawings, terms and conditions of contract etc. This shall include, but not be restricted to the following;
- q. Contractor shall ensure for adequate manpower for labor, erection, commissioning, site supervision and planning to carry out the work as per completion requirements of the Client. All working man power should be with all required PPE while working on site.
- r. The supply of all tools/instrument and equipment for installation, alignment, testing and commissioning is the responsibility of the Contractor. The Contractor shall also include all vehicles including but not limited to automobiles for personnel transportation, pickup trucks, tractors and trailers, welding machines, cranes and all necessary handling and erection equipment such as cranes, tools, tackle and scaffolding. Contractor should submit test certificate for all tools and tackles before using them on site and should keep them available on site.

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- s. The Contractor shall supply all consumables but not limited to welding electrodes, industrial gases (oxygen, acetylene, argon etc.), fuels and lubricants for Contractor's equipment, jointing compounds and PTFE tape, emery tape, cleaning rugs, saw blades, all chemicals for cleaning etc.
- t. The Contractor must guarantee that all work will be performed in accordance with good and sound engineering and construction practices and within the requirements of this requisition. The bought-out items supplied by the Contractor must be free from defects, must be suitable for the use for which they are intended and must perform in accordance with the requirements of this requisition.
- u. The Contractor must agree to promptly correct, replace at his own cost at site, all the defects and mal-performance of the piping and piping components and/or the accessories supplied by Contractor to comply with obligation expressed or implied under the Material Requisition (MR) and to extend the warranty period for the duration required to remedy such defects.
- v. Supply, Installation, Testing & Successful commissioning of the following:
 - I. Air Conditioning units (Indoor cooling unit & Air-Cooled Outdoor Condensing unit)/ventilation fan with motors and Drives etc.
 - II. Insulation for Refrigerant Piping.
 - III. Air Distribution system with Sheet Metal ducting, insulation, dampers, etc.
 - IV. Supply air grilles / Diffusers, GSS frame for mounting of Floor grilles /diffusers in false flooring.
 - V. Supporting, Foundation bolts, Grouting, Vibration Isolators, Base Frames etc. for mounting the outdoor condensing unit, indoor Cooling Unit, other equipment, duct, pipes, cables & wires.
 - VI. All other works associated with above items as per specifications, drawings and conditions of contract except those specifically excluded.
 - VII. All Minor Masonry, Carpentry and Civil works such as cutting opening in Masonry Walls, Internal Partitions, RCC Slabs etc. for Pipes and Cables and making them good the same to match existing works / décor shall be done by the Contractor, wherever asked for by the Engineer-in-Charge.
 - VIII. Drainage pipe from unit to drain sump.
 - IX. Bidder to include First charge of refrigerant in scope
 - X. All necessary accessories such as clamps, gaskets, brackets, hangers, screws, nuts, bolts, washers, etc., will be included in VENDORS scope of supply.
 - XI. All electrical, Instrument & control work associated with HVAC system shall be in vendor scope of supply.
 - XII. Bidder to provide and include in the cost necessary tools for maintenance of equipment like allen key, screw driver, spanner set along with equipment.
- w. Other activities:
 - I. Contractor has to follow the preliminary project schedule as given by CLIENT/Consultant. Contractor has to submit their detail activities schedule in MS-Project (2003 version) to CLIENT/CONSULTANT for their approval.

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- II. The contractor has to co-ordinate with Package vendor/OEM/Owner/other contractors to ensure that each type and piece of equipment specified will meet the operational and functional requirements. And for smooth execution of project in co-ordinated manner.
 - III. Testing, Adjusting and Balancing of the entire Air Conditioning unit with air distribution system in compliance with ASHRAE & SMACNA (Manual for the balancing and adjustment of air distribution system).
 - IV. Cleaning of site, equipment, ducting & piping systems. Contractor to bring all required cleaning agents, inhibitors and chemicals for this activity. After cleaning all system to be dried before handing over to owner.
 - V. Test reports, list of recommended spares, as-installed drawings, operation and maintenance manual for the entire Air Conditioning installation.
- x. Special Instruction:
- We understand that the bidder has reviewed the entire BOQ and technical specifications. Therefore, bidders are required to include all necessary items to ensure the completeness of the HVAC system within their scope. In case any additional items are required for proper functioning or compliance, the bidder must highlight these at bidding stage.

5. CODES AND STANDARDS

- 5.1 All equipment, system and works covered under this specification shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. Also, all equipment shall conform to the latest applicable Indian or International Standards established to be equivalent or superior to the Codes and Standards specified in this specifications. In case the BIDDER offers equipment conforming to any standards other than those specified in specifications, the BIDDER shall furnish copies of standards translated in English while submitting his proposal. In the event of conflict between the Codes and Standards referred to in the specification and the requirement of this specification, the later shall govern.
- 5.2 The latest issue of IS codes prevailing at the time of submission of final offer shall be applicable. However, if there are any revisions during the execution of the contract, the same shall be applicable and the cost implication if any shall be mutually discussed.
- | | | |
|-----------|---|---|
| ASHRAE 15 | : | Safety Code for Mechanical Refrigeration |
| ASHRAE 23 | : | Methods of Testing for Rating Positive Displacement
Refrigerant Compressors and Condensing Units |
| IS 7613 | : | Method of Testing Panel Type Air Filters for Air-Conditioning
and Ventilation Purposes |
| IS 3103 | : | Code of practice for industrial ventilation |
| ASHRAE 33 | : | Method of Testing - Forced Circulation Air Cooling and Air
Heating Coils |

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ASHRAE 52.1	:	Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter
ARI 430	:	Central Station Air-Handling Units
NFPA 90A	:	Installation of Air-conditioning and Ventilating Systems
IS 277	:	Galvanized Steel Sheets (Plain and Corrugated)
IS 655	:	Metal Air Ducts
IS 737	:	Wrought Aluminium and Aluminium Alloy Sheet and Strip for general Engineering Purposes
SMACNA	:	HVAC Duct Construction Standards - Metal and Flexible, HVAC Air Duct Leakage Test Manual HVAC Systems - Testing, Adjusting and Balancing
UL 555	:	Fire Dampers
NBC 2016	:	National building code
IGBC	:	Green Building Certification
ASHRAE 21	:	Guide for Ventilation and Thermal management of batteries
IS 8148	:	Packaged air-conditioners
ARI-430	:	Performance Rating of Central Station Air-handling Unit Supply Fans
ARI-520	:	Performance rating of positive displacement condensing units
ARI-270	:	Sound Performance Rating of Outdoor Unitary Equipment
ISHRAE	:	Indian society of heating, refrigeration & air conditioning Engineers
IS 4894	:	Centrifugal fans
IS 659	:	Safety code for air-conditioning
IS 2312	:	Propeller type AC ventilating fans

6. LAYOUT REQUIREMENTS

After award of contract BIDDER shall furnish detailed layout drawings, and cross sectional drawing of each equipment indicating actual equipment GA, proper layering, schedules/tables of equipment/dampers/grilles/louvers, proper equipment tagging, Indicating duct routing/sizes/supporting/Insulation, Indicating duct routing/sizes/supporting/Insulation, typical installation drawing, applicable code/standard etc. for purchaser's approval. VENDOR shall take care of all comments indicated in the drawing by purchaser. These comments will be based on specification, relevant code/standard, statutory regulations good engineering practice, layout requirement, ease in maintenance etc. for which no extra claim shall be provided to the bidder.

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7. OPERATIONAL AND MAINTENANCE REQUIREMENT

NA

8. TERMINAL POINTS

Terminal points	Description	Bidder Remark
Electrical Power Supply	Single point 3 phase power supply shall be provided to HVAC panel. HVAC Panel and Power supply from HVAC panel to each equipment shall be HVAC bidder scope. This includes electrical components like HVAC panel, cable, cable tray, earthing and supporting.	
Equipment pedestal/ Foundation/ Cut-outs	It shall be provided by Civil contractor, HVAC vendor to provide requirement and dimensions of foundation and Major cutouts. Any minor cutting is required suite at site is scope of HVAC bidder.	
HVAC Duct, cable, cable tray, pipe supports	All kind of primary & secondary supporting arrangement for HVAC system is HVAC bidder scope	
Drain Piping	Insulated Drain piping up to nearest drain sump is HVAC bidder scope.	
Control & Instrumentation	All required Sensors (temperature, pressure sensor, humidity) is HVAC bidder scope is HVAC bidder scope Necessary Controller for HVAC system temperature/RH and pressure control, equipment sequencing and auto switch over is HVAC bidder scope. Interlocking of HVAC system with sensors, fire alarm panel is HVAC bidder scope. Interlocking of fire damper with fire alarm panel and HVAC equipment is HVAC bidder scope.	

9. PERFORMANCE PARAMETER

- Vendors to confirm performance of air condition system to meet design conditions given below at highest summer condition. The system has to maintain the specified inside design conditions.

Inside Conditions	:	Temperature As mentioned in Table-1
Relative Humidity	:	55% +/- 5%
Pressure	:	Pressure as mentioned in Table-1
Fresh air	:	5 Cfm per person + 0.06 cfm per ft ²

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- Vendors to confirm performance of ventilation system to meet design conditions given below at highest summer condition. The system has to maintain the specified inside design conditions.

Inside Conditions	:	Temperature As mentioned in Table-2
Relative Humidity	:	NA
ACPH	:	As per above Table-2
Pressure	:	Pressure as mentioned in Table-2

10. SPARES AND SPECIAL TOOLS AND TACKLES

10.1 MANDATORY SPARES

Bidder to consider cost of mandatory spare as per specifications. The spares supplied shall be strictly interchangeable with parts for which they are intended for replacement. The spares shall be treated and packed for long storage (minimum 5 years) under the climatic conditions prevailing at the site. The start-up spares shall be delivered at the site well in time before the start-up and commissioning of the plant.

10.2 START-UP SPARES

The start-up spares are those spares which will be required during start-up and commissioning of the equipment/systems, and until Final Take Over. It is the responsibility of the bidder to supply all the necessary spares as required until the equipment/systems are handed over to the Owner. An adequate stock of start-up spares shall be available at the site such that the start-up and commissioning of the equipment/systems, performance testing and handing over the equipment/systems to the Owner will be carried out without hindrance and delay. All start-up spares which remain unused after the taking over the sub- station shall remain the property of the Owner. The Bidder shall furnish the Schedule of Start-up Spares.

10.3 ESSENSIAL SPARES

Essential spares are those considered necessary by the owner for first three (5) years of normal sub-station operation. A list of such spares has been listed in the below mentioned table and the same shall be included in bidder's scope. When a particular item of spares is indicated as 'percentage', it shall be considered as percentage of total number of that item of spares in the single equipment/system, unless specified otherwise and the fraction shall be rounded off to the next higher whole number. Whenever the item of spares has been indicated as 'set' the same shall mean the supply for a single equipment/system. One set of spares for the particular equipment shall mean the total quantities of that particular spares for a single equipment e.g., 'set' of motor, set of contactors, capacitors, cables, etc. The 'set' shall however include all components required to replace that item of spares.

The Owner reserves the right to buy any of the essential spare parts as considered necessary. In case during start-up and commissioning certain essential spares are used up, the same shall be replaced within one (1) month without any commercial implications. VENDOR shall furnish details for all essential spares as per the approved vendor document list.

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10.4 RECOMMENDED SPARES

In addition to the spares mentioned above, the Bidder shall also furnish in his bid a list of recommended spares with unit prices. The Owner reserves the right to buy any of the recommended spare parts as considered necessary by him. The prices of recommended spares shall be consistent with those of start-up/essential spares. Purchase of these spare parts will be covered by a separate order or an amendment to the contract.

The Bidder shall provide a list of recommended spares for a period of five years from the date of Site Acceptance Test (SAT) and confirm that the shelf-life of these spares is such as to last for at least 7 years from the date of SAT.

10.5 SPECIAL TOOLS & TACKLES

Bidder to consider and supply special tools and tackles required for erection, commissioning and maintenance of the offered system. After commissioning of the system all tools and tackles shall be handed over to Owner's Project/Maintenance team. All tools (both hardware and software), test instruments, simulation jigs, documents, programming equipment etc. required for Installation, Testing & Commissioning are in the scope of bidder.

All configuration cables and other specialized testing passive devices to be provided with the supply of material.

Note: bidder to indicate the list of spares which are not required.

11. DATA SUBMISSION BY BIDDER

Bidder shall submit the following information along with the Technical Bid for both HVAC systems.

11.1 ALONGWITH BID

The bidder shall submit the following mandatory information along with the Technical Bid. Failure to provide any of the required documents will result in disqualification, and the bid will not be considered for further evaluation

- a. Bidder to submit technical data sheet of the critical equipment with following minimum details for each equipment.
 - Equipment make
 - Model number
 - Equipment Type & quantity
 - Equipment capacity
 - Fan type
 - Compressor type
 - Refrigerant type
 - Power consumption (for each Indoor & Outdoor)
 - Dimensions and weight
 - Noise level

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- BEE star rating
- b. Bidder to only provide compliance to technical specifications
- c. Bidder to provide compliance to terminal points
- d. Bidder to provide compliance to spare part considered
- e. Bidder to provide compliance to pre bid qualification requirement along with supportive documents and OEM authorization latter.
- f. Bidder to provide compliance to performance requirement.
- g. Bidder to provide compliance to Make list
- h. Deviation schedules
- i. Catalogues of the equipment's offered.

11.2 AFTER AWARD OF CONTRACT

The following documents shall be submitted for Owner's approval during detailed engineering:

- a. Heat load calculations.
- b. Detailed layouts of HVAC system which shall cover all equipment with actual GA, ducting, piping, cut-outs, supporting and foundation requirements.
- c. Detailed section and elevation layouts.
- d. Air flow diagram
- e. BOQ as per the requirements.
- f. Bidder to submit all datasheets detailed GTP of the proposed BOM items during detailed engineering for the approval and finalization by Owner.
- g. Other documents as may be required / applicable during detailed engineering
- h. All drawings and data shall be annotated in English
- i. Bidder to note that during detailed engineering documentation related to project shall be done on Owners web based system "wrench". Vendor to submit "as built" drawings in six (6) hardcopies and 3 soft copies on reliable media of all drawings, manuals (Administration, Operation & Maintenance, Troubleshooting and Installation), Technical catalogues, Test Certificates and Acceptance Test Reports.
- j. Two copies of the internal test report, FAT and SAT documents with test protocol formats shall be submitted for approval at least 4 weeks before Factory Acceptance Test. Two copies of SAT protocol shall be submitted for approval at least two weeks before Site Acceptance Test.
- k. Bidder shall also furnish Original plus one copy of all System Software (OS, Application and tools) along with delivery. Bidder shall submit two copies of all the configuration, application, display, database backup of all equipment on reliable secondary media.

12. APPROVED MAKE LIST

Chiller	Blue Star / Voltas / Carrier / Daikin – McQuay,Trane / Kirloskar / Clivet / Climaveneta/York/DB
Air handling units	Bluestar / Voltas/ Carrier / ETA / Trane / Caryaire / Zamil / Edgetech / Systemair / VTS /Clivet / Zeco / Waves/ Citizen
Condensing Unit (Air Cooled / Water Cooled)	Bluestar / Voltas/ Carrier / Trane / Mitsubishi / Hitachi/ Samsung/ Daikin

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Packaged Air Conditioners	Bluestar / Voltas/ Carrier / Trane / Mitsubishi / Hitachi/ Samsung/ Daikin
Roof top air conditioners	Zamil / Trane / Dunam bush/ Carrier
Non Ductable Split / Cassette units	Blue Star / Voltas / Carrier / O'General / LG / Daikin / Mitsubishi / Hitachi / Samsung / Panasonic
Ductable split air conditioners	Blue Star / Voltas / Carrier / LG / Daikin / Mitsubishi / Hitachi / Edgetech / Toshiba / O-General
Centrifugal fan / Axial fan	Patel Airflow / Flakt / Nadi / Kruger / Nicotra / Greenheck / Comefri / SK Systems / Draft Air / Sarala fans / Aerovent / Conaire
Cooling coil	Zeco / McCann / Edge Tech
Air filter	AAF (American Air Filter) / John Flower / Purogen/ Spectrum / Anfilco / Dyan / Aerosol / Conaire/ frudenberg
Automatic Air vents	Flamco / Amtrol / Anergy / ITAP
Motorized actuators for dampers and valves for open / close and Modulating duty	Belimo / Joventa / Siemens / Honeywell / Johnson / Sauter
Strip heater / Steam Humidifier	Alco / Hot set / Sauter race / Daspass
C.I Gate / Globe / Check valve (65 NB to 500NB)	Advance / Bankin / Leader / Crawley & Ray / Kolley / H.Sarkar / Crane / IPC
Exhaust fan (propeller type)	Almonard / Kruger / Khaitan fans / Patel air flow / Nicotra / Dustven / CB doctor / SK systems / Draft air / Sarala fans
G.I.Sheet	Tata / SAIL / Bhusan steel / Jindal / Essar / Nippon
M.S / G.I Pipe	Ajanta tube / Jindal pipe / Surya roshni / TISCO / Bansal / SAIL / Maharastra Seamless
CI / M.S.Y-Strainer	Sant / H Sarkar / Emerald / DS Engg / Crane
Butterfly valve	Advance / Intervall / L&T Audco / IPC
RH sensor / Temp Sensor/Modulating Motor / DP switch	Honeywell / Jonson control / Siemen / D.K instrument / General Instrument
Insulation	UP Twiga / Lloyd / Ownes Corning / Kimmco / Armacell / K-Flex / Vidoflex / Rockwool / Thermobreak
Expanded Polystyrene (Pipe section &slab)	Beardsell / Thermowel / Llyods / Cooline / Quality Thermopack
Pre insulated pipes	Sevenstar / Aerovent
Grills/ Diffuser(AL) / VCD / Louvers / Fire dampers / Fire and Smoke damper	Ravistar / Dynacraft / Caryaire / Air master / Ruskin / GreenHeck / Conaire
Balancing Valves	Advance / T & A Hydronics / Intervall / Audco / Flowcon
Ball Valves	Advance / Intervall / L & T Audco / TAP / RC / ITAP / RB
Check Valve	Audco

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Geyser stat / Air stat	DK Instruments / Honeywell
Roof extractors	CB Doctor / SK systems / Draft air / Patel airflow / Kruger / Sarala fans / Aerovent / Nicotra / Roots cooling systems
LT Motors	ABB / Crompton Greaves / Siemens / BBL / Kirloskar
Centrifugal Pumps	Grundfos / KSB / Armstrong / ITT / Kirloskar / Beacon
VRF System	Daikin / Samsung / Hitachi / Toshiba / Bluestar / Mitsubishi / Voltas / LG
Plate Heat Exchanger	Alfa Laval / Sondex
Vibration Isolators	Resistoflex / Flexionics / Mason / Dunlop
Factory fabricated ducting	Zeco / Alfa duct / CAM duct
Temperature Sensors	Greystone / Johnson Control / Honeywell
VFD	Danfoss / ABB / Honeywell / Siemens / Johnson Controls
Chemical Dosing System	Nalco / Milton Roy / ION Exchange
Chilled water type Hi-wall unit / Fan Coil Unit / Cassette unit	Bhutoria / Waves / BOSCH / Zeco / Voltas / Bluestar /
Pressure / Temperature Gauge	Waree / H Guru / A N Instruments
VAV (Variable Air Volume)	Daikin / Johnson Controls / Belimo / Honeywell / Systemair / Ruskin / Greenheck
Precision Air Conditioning Units	Emerson / Stulz / Schiender / Trane
Two Way proportional control valves with electrical actuator	Siemens / Honeywell / Belimo / Flowcon
Insulated flexible ducts	Supaflex / Caryaire / K-Duct / Interlock
Motorized Dampers / Motorized Smoke and Fire Dampers	Zeco / Ruskin / Greenheck / Ravistar / Airmaster
Ultrasonic BTU Meters Expansion tank	Kemsterup / Khrono / Marshall Anergy

13. QUALITY REQUIREMENTS, INSPECTION, TESTING

- Please refer General QA&I requirements chapter enclosed separately. Also, refer SQP (Standard Quality Plans) as minimum inspection requirements base on which bidder will submit detailed MQPs. Quality Assurance Plan (QAP), Manufacturing Quality Plan (MQP), Field Quality Plan (FQP)
- To ensure that a well-engineered and contractually compliant system is produced, vendor shall adhere to a quality assurance program for the preparation of all contract deliverables, which includes hardware, software and documentation. The program shall provide for early detection of actual or potential deficiencies, timely and effective corrective action, and a method of tracking all such deficiencies.

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14. ANNEXURE

Annexure I : Specification For Air Distribution System
Annexure II : Specification For Air Handling Unit
Annexure III : Specification for VRF System
Annexure IV : Specification for Refrigerant
Annexure V : Specification for Insulation
Annexure VI : Specification for Ventilation Fans
Annexure VII : QAPs

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STANDARD TECHNICAL SPECIFICATION
FOR
VRF SYSTEM

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- 2. codes & standards**
- 3. Constructional features**
- 4. Electrical**
- 5. Specific instructions to bidders**
- 6. Submission by bidders**
- 7. Performance Parameter**
- 8. Performance guarantee**
- 9. Mandatory Spare**
- 10. Datasheet**

1.0 SCOPE

- 1.1 This specification covers the general design, materials, construction features, manufacture, shop inspection and testing at manufacturer's works, delivery at site, handling at site, installation, testing, commissioning, performance testing and handing over of VRF system.
- 1.2 Real time based sequential panel, timer control with auto change over between units shall be provided for all the AC plants so that one by one machine will come in operation for set time duration. In case of failure of one machine, next machine will come in operation. In case of additional load, additional AC machine next in the sequence will also come in operation.
- 1.3 The requirements laid down in this specification are the minimum requirements. Nothing herein shall be construed to relieve the CONTRACTOR of their responsibility for ensuring the equipment's full integrity and performance.
- 1.4 Commissioning spares shall be in the scope of supply of Vendor till successful commissioning of plant with product.
- 1.5 The vendor must guarantee that spare parts for the selected equipment model remain available for a long-term duration.

2.0 CODES AND STANDARDS

The design, materials, construction, manufacture, inspection, testing and performance of VRF shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility. In particular, the VRF shall conform to the latest editions of following standards:

ASHRAE 15/34	Safety Code for Mechanical Refrigeration
ASHRAE 37	Methods of Testing for Rating Unitary Air-Conditioning and Heat Pump Equipment
ASHRAE 23	Methods of Testing for Rating Positive Displacement Refrigerant Compressors and Condensing Units
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ASME Section VIII Division I (Unfired Pressure Vessels)	

ANSI B31.5	Refrigeration piping (Current Edition)
IS 2501	Solid drawn copper piping for general engineering
IS 1391	Standard for Unitary Air conditioning system
IS 8148	Packaged air conditioners – specification
ISO 16358	Air cooled air conditioners and air to air heat pump testing and method of seasonal performance
AHRI 550/590	Performance rating of water chilling and water heating package using vapor compression cycle
AHRI 410	Performance rating of forced circulation air cooling and air heating coils

3.0 CONSTRUCTIONAL FEATURES

The unit shall consist of an outdoor unit (air-cooled condensing unit), Multiple indoor unit (evaporating unit) connected with single outdoor, an electronic control unit, Interconnecting refrigerant piping, drain piping, cabling and wiring between Indoor and Outdoor. Unit to be selected for 24 hr operation and spare parts should be easily available.

3.1 Out Door Unit:

- The outdoor unit shall house compressor, air cooled condenser with fan, refrigeration controls like Hi-Low pressure cut outs, etc.
- Cabinet shall be fabricated out of heavy gauge galvanized sheet steel properly formed for close fit and structural rigidity. All access panels shall be so constructed as to be quickly and easily removable. All sheet metal surfaces shall be finished in baked enamel paint or powder coating.
- Air-cooled condenser coil shall be made from copper tubes and aluminum fins bonded to the tubes. Condenser fans shall be propeller type. The entire air-cooled condensing unit shall have sheet metal housing suitable for outdoor installations. The surface of

the condenser coil shall be coated with suitable chemical coating to prevent corrosion/deterioration due to coastal climate

- Compressor shall be inverter type and the hermetic scroll/ reciprocating type with suction and discharge valves, gas cooled motor, vertical crank-shaft balanced and mounted on vibration absorbers to provide quiet, free-floating operation. Compressor shall be provided with overload protection and single phasing protection.
- The condensing unit shall be capable of assessing the requirement of liquid refrigerant volumetric flow of each evaporating unit at all times by means of a sophisticated microprocessor controller and generating the required total volume of refrigerant liquid for supply to the evaporator units.
- Unit should be equipped with a highly efficient oil separation system to ensure stable operation with long refrigerant piping.
- Scroll Compressor shall be hermetically sealed type. Motor shall be suitable for single phase 230 V + 10%, AC, 50 Hz or three phase 415V power supply, with built-in overload protection, mounted on vibration isolator rubber mounts.
- ODU to be supplied with supporting MS stand with powder coating or galvanized.
- The noise level of the unit shall not be more than 65dB (A) measured horizontally 1 m away and 1.5 m above base level
- Local MCB to be provided for ODUs.

3.2 Indoor Unit:

- Each unit shall be selected as the requirement of the cooling load and interior layout in the respective space to be air-conditioned.
- Hi-wall: The Indoor unit shall house the cooling coil, air filter, evaporator fan, electronic expansion valve which can communicate with the VRF controller in the condensing unit with motor and air filter, installed in an aesthetically appealing plastic molded body made out of ABS or other engineering plastic material. The fan motor shall be designed for low noise, maximum speed being limited to 900 RPM. Noise level of the unit at highest speed shall not exceed 40dBA. Unit shall be suitable for mounting on wall. Indoor unit fan speed shall be controllable with 3 to 4 stage of speeds. Split AC to be provided with cordless remote controller. Noise level should be 30 dBA or below.
- Ductable unit: The unit shall be of heavy gauge steel, corrosion resistant, finished with synthetic enamel paint and thermally and acoustically insulated with resin bonded

fiberglass or equivalent material. Unit shall be with hi flow hi static type. Fan shall be centrifugal type all other accessories fan, fan-motor, Air filter, an electronic expansion valve which can communicate with the controller in the condensing unit and suspension bracket on the body to be provided. Supports to be provided with spring isolators. The unit shall be suitable for ceiling suspension. Trap doors to be provided for ductable unit installed above false ceiling. Bidder to provide size of trapdoor. Ductable units to be provided with drain pump. Indoor unit fan speed shall be controllable with 3 to 4 stage of speeds. Ductable unit to be provided with corded remote controller. Noise level should be 60 dBA or below.

- **Cassette unit :** The unit shall be of heavy gauge steel, corrosion resistant, finished with synthetic enamel paint and thermally and acoustically insulated with resin bonded fiberglass or equivalent material. Unit shall be 4 way. Each unit shall be selected as the requirement of the cooling load and interior layout in the respective space to be air-conditioned. The unit shall be equipped with automatic drain-pump, fan, fan-motor, Air Filter, an electronic expansion valve which can communicate with the controller in the condensing unit, and all related accessories. The fan shall be of the dual suction multi blade type and statically and dynamically balanced to ensure low noise and vibration free operation. Unit to be provided with cordless remote. Unit size should be suitable for false ceiling grid size for ease of installation. Noise level should be 30 dBA or below.

3.3 Electronic Control Unit:

- A Remote-Control Unit shall be provided for the system, suitable to be mounted in easily accessible area on respective floor. For open area, it should be possible to operate the entire air conditioning system and set working parameters of all indoor units from a centralized Touch controller. For rest of the area individual remote to be provided to control Indoor Unit. The unit shall be equipped with self-diagnosis for easy and quick maintenance and service. The remote controller shall memorize the latest malfunction code for easy maintenance. The controller shall be equipped with a battery back-up and a real-time clock.

3.4 Interconnecting Refrigerant Piping & Wiring:

- The refrigeration piping shall be complete with externally equalized, thermostatic expansion valve, liquid line strainer, dehydrator with replaceable drying agent and liquid line shut-off valve.
- The piping shall be designed for an internal pressure representing the most severe condition of coincident pressure and temperature expected in normal operation.

- The refrigerant piping interconnecting to indoor & outdoor units shall be of copper and shall be joined by brazed type joints. Suction line shall be insulated with 6mm or (as per manufacturer recommendation) thick sleeve made out of closed cell elastomeric nitrile rubber foam insulation of fire retardant 'O' class. Wiring interconnecting the indoor and outdoor unit shall be done with PVC insulated copper conductor flexible wires of appropriate rating.
- All piping shall be supported on hot-dip galvanized perforated cable trays, and covered by GI sheet channels from the top wherever required, to prevent any type of damage during/after execution. The GI covers and trays shall be fixed to MS angle supports by bolting, to facilitate removal of the trays for verification of pipe leaks. All supports/clamps shall be painted with red oxide primer followed by 2 coats of synthetic enamel finish paint.
- The piping and wiring shall be laid such that it does not spoil the aesthetics of the premises, and is safe, secure and approachable for repair/replacement.

Note: For Split/ ductable AC/cassette AC all standard wall mounting and ceiling suspension support/ anchor bolt to be considered and provided.

Note: For Split/ ductable AC/cassette AC refrigerant pipe size to be selected as per OEM recommendation.

3.5 Drain Piping:

- The drain piping shall be made out of rigid CPVC pipes of 6 Kg/cm² class in screwed construction. The piping shall be insulated with closed cell nitrile rubber foam sleeve tightly fitted on the outer surface of the pipe. All insulation joints shall be sealed by insulation tape.
- The drain pan shall be connected to rigid PVC pipe by braided PVC flexible pipe with appropriate adaptors. The flexible pipe and adapters shall also be insulated in the same way as the rigid pipe.
- Vendor has to consider proper support/tray for laying of pipes & also needs to consider conduit or concealing of pipes wherever required.

4.0 ELECTRICAL

- 4.1 A terminal box on starter panel suitable for connecting external 3 phase, 4 wire cable shall be provided.
- 4.2 The unit shall be provided with single phase preventers for all motors.
- 4.3 DBs to be provided for indoor units cassette AC/ ductable/Hi wall unit
- 4.4 Local MCB to be provided for all Outdoor units
- 4.5 All units shall be with inbuilt starter.
- 4.6 The starter panels for indoor and outdoor units shall be pre-wired at the factory and shall be complete with starters for all motors.
- 4.7 Cabling and Wiring between starter panel and indoor / outdoor units shall be carried out at site by HVAC vendor and to be considered in the scope.
- 4.8 Corded/cordless remote controller shall be provided. Remote controller shall have ON/OFF, temperature control, fan speed control options.

5.0 SPECIFIC INSTRUCTIONS TO BIDDERS

- 5.1 The BIDDER shall furnish all the information called for in various schedules failing which the bid will be considered incomplete & the purchaser reserves the right to reject the bid.
- 5.2 The BIDDER shall carefully study all sections of this specification and indicate all deviations in the Schedule of Deviations. If deviation sheets are not submitted in the Schedule of Deviations sheets, it will be presumed that the offer conforms in all respects to the specification and the purchaser reserves the right to reject the same. Bids as such without any further reference to the BIDDER. If the BIDDER indicates any comments on specification elsewhere in the Bid, the same will not be accepted as the basis for extra claims for conformity with the specification after award of the Contract. No deviations post bid will be entertained.
- 5.3 The scope of equipment to be supplied under this contract is detailed hereinafter.
- 5.4 The BIDDER shall prepare and submit three copies of the system "Operation, Maintenance and installation Manual" within the time schedule specified for the contract and before handing over the system for operation.
- 5.5 BIDDER shall indicate necessary start-up spares required during erection, testing and commissioning and included in the quoted price.
- 5.6 The BIDDER shall furnish make, type, and model number etc. of all bought-out components / items along with his Bid as per approved vendor list. All other vendors shall be subject to the owner's approval.

- 5.7 After award of contract BIDDER shall furnish detailed layout drawings, and cross sectional drawing of each equipment indicating material of construction, applicable code/standard etc. for purchaser's approval. VENDOR shall take care of all comments indicated in the drawing by purchaser. These comments will be based on specification, relevant code/standard, statutory regulations good engineering practice, layout requirement, ease in maintenance etc. for which no extra claim shall be applicable after placement of order.
- 5.8 BIDDER shall furnish detailed bar chart for the scope of services within a week after the date of issue of Letter of Intent/P.O.

6.0 SUBMISSIONS BY BIDDERS

- 6.1 Bidder shall submit the following Data sheets / information along with the Technical Bid.
- 6.1.1 Dully filled in schedules.
 - 6.1.2 Filled datasheet
 - 6.1.3 General Arrangement Drawings for equipment offered
 - 6.1.4 Layout of AC plant indoor and outdoor units
 - 6.1.5 Detailed description of the equipment and brochures with regard to technical details
 - 6.1.6 Various submittals as called for in the specification.
 - 6.1.7 Operation and maintenance manual
 - 6.1.8 Spare list

7.0 PERFORMANCE PERAMETER

- Cooling capacity at 40 Deg C ambient as per BOQ/drawings
- Noise level as per tender specification
- Electrical power consumption as per load list

8.0 PERFORMANCE GUARANTEE

- 8.1 The equipment shall be designed for continuous operation to satisfy the performance as specified in the specification.
- 8.2 Instruments required for performance testing at shop as well as site shall be supplied by Vendor. These may be taken back by the Vendor after the conclusion of the test. The class of accuracy of the instruments shall be as specified in the code. The detail procedure of test shall be jointly agreed upon prior to commencement between Purchaser & Vendor.

- 8.3 The guaranteed performance figures (with tolerances as per standards) of the equipment shall be proved by Vendor during tests. Should the results of these tests show any deficiency from the guaranteed value, Vendor shall modify the equipment as required at no extra cost.
- 8.4 Till the successful completion of performance/ acceptance test, Purchaser shall not be responsible for providing any supervisory or skilled manpower or operators.
- 8.5 No tolerance shall be permitted on quoted guaranteed figures, except measurement tolerances as per applicable codes. Necessary correction factors in final form for variation of parameters shall be furnished before the performance guarantee test.
- 8.6 If Vendor fails to achieve the guarantee set forth above, Vendor shall investigate the causes and undertake to rectify and replace, free of cost to Purchaser, the defects of the plant within a period mentioned in the terms of contract and prove the guarantee.
- 8.7 Equipment shall be guaranteed for the specified duty, for repair/replacement, free of cost to Purchaser of any defect, fault or deficiency in vendors design, engineering, material, workmanship, construction/fabrication and manufacture
- 8.8 The guarantee shall cover free replacement by Vendor to the satisfaction of Purchaser of any malfunctioning component due to defective material, wrong selection or faulty fabrication within the period of guarantee.
- 8.9 Liquidated damage charges towards power/utility consumption shall be as per PO terms.

9.0 MANDATORY SPARE

SCHEDULE OF MANDATORY SPARES			
The Bidder shall Include the price for the mandatory spares			
Sr. No.	Equipment tag no.	Description of spare	Remarks
1	IDU & ODU	AS PER VENDOR RECOMMENDATION	
	(FOR EACH MODEL /		
	SIZE)		
2	CABLES AND	TERMINATION KIT FOR EACH SIZE OF CABLES	
	ACCESSORIES	LUGS 10% OF TOTAL WITH ATLEAST ONE OF	
		EACH SIZE WHICHEVER IS HIGHER	

3	PANEL	10% OF TOTAL WITH ATLEAST ONE OF	
	ACCESSORIES	EACH SIZE WHICHEVER IS HIGHER	
4	INSTRUMENTS	MIN 1 NO OR 10 % OF TOTAL QUANTITY	
		WHICHEVER IS HIGHER, FOR EACH TYPE OF	
		INSTRUMENT	
5	LOCAL PANEL	MIN 1 NO OR 10 % OF TOTAL QUANTITY	
	MOUNTED		
	HARDWARE	(WHICHEVER IS HIGHER), FOR EACH TYPE OF	
		HARDWARE.	
6	ANNUNCIATION	1 NO OF EACH TYPE OF I / O	
	SYSTEM		
7	I & C CABLES	10 % OF TOTAL QUANTITY OF EACH TYPE	

10.0 DATASHEET

**STANDARD TECHNICAL SPECIFICATION
FOR
INSULATION**

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- 3. Material requirement**
- 4. Installation procedure**
- 5. Acoustic Lining**

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1. SCOPE

This specification covers the technical requirements and essential particulars for the supply, application and finishing of the complete thermal insulation for cold equipment, piping systems, air-conditioning ducts etc. for temperatures between ambient and (-) 80 deg C and also for dual temperatures (both hot and cold) service with hot temperature above ambient and up to 230 deg C.

2. CODES AND STANDARDS

The design, materials, construction features, manufacture, inspection, testing and performance of Thermal Insulation system shall comply with all currently applicable statutes, regulations, codes and standards in the locality where the system is to be installed. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility. In particular, thermal insulation system shall conform to the latest edition of following standards:

IS 8183	Bonded Mineral Wool
IS 9842	Preformed Fibrous Pipe Insulation
IS 14164	Industrial Application and Finishing of Thermal Insulation Material at Temperatures above (-) 80 ⁰ C and up to (+) 750 ⁰ C
BS 3927	Rigid Phenolic Foam (PF) for Thermal Insulation in the Form Slabs and Profiled Sections
BS 5608	Preformed Rigid Polyurethane (PUR) and Polyisocyanurate (PI Foams for Thermal Insulation of Pipework and Equipment
BS 5970	Thermal Insulation of Pipework and Equipment (in the Temperature Range (-) 100 ⁰ C to (+) 870 ⁰ C)
IS 277	Galvanised Steel Sheets (Plain and Corrugated)

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IS 737	Wrought Aluminium and Aluminium Alloy Sheet and Strip for General Engineering Purposes
IS 3144	Mineral Wool Thermal Insulation Materials - Method of Test
IS 3677	Unbonded Rock and Slag Wool for Thermal Insulation
IS 4671	Expanded Polystyrene for Thermal Insulation Purposes

3. MATERIAL REQUIREMENT

- 3.1 All materials shall be new and fresh, incombustible, fire retardant, rot-proof, non-hygroscopic, vermin proof, fungus proof, non-injurious to health, chemically inert, non-corrosive to steel and aluminium (even if soaked in water for extended periods) and shall be guaranteed to withstand continuously and without deterioration the minimum and maximum temperatures to which these shall be subjected to under the specified applications.
- 3.2 The insulation materials and any component of the finished insulation job shall not react chemically, singly or in combination, with water or moisture to form substances that are more actively corrosive to applied surface than water or moisture alone.
- 3.3 In order to protect the workers from the hazards of insulation materials, suitable protective gadgets shall be provided. Required safety precautions shall be taken during handling and application of insulation.

SL. NO.	INSULATION MATERIAL	DENSITY Kg/M	TEMP. RANG 0C	MATERIAL CODE
1.	Rigid polyurethane / Polyisocyanurate foam	32	(-)80 to 110	PUR/ PIR
2.	Resin-bonded glass wool pipe sections	85	(-)40 to 230	PSG

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3.	Open cell Nitrile Rubber Acoustic Insulation	140-180	(-) 80 to 230	U150
4.	Closed cell Elastomeric non Polar-Anti Microbial-UV resistant – Class O and Nitroamine free, Nitrile Rubber Thermal Insulation	40-60	(-)40 to 105	UL94
5.	Closed cell Chemical cross linked polyethylene foam	25	(-) 80 to 105	XLPE

- 3.4 Closed cell Chemical cross linked polyethylene foam (XLPE) or Nitrile Rubber Sheets with anti-bacterial properties are recommended. The Product shall have temperature range of - 80°C to 105°C as per standard DIN EN 14706: 2005 & ASTM C411.
- 3.5 Thermal conductivity of the insulation material shall not exceed 0.034 W/m.K at an average temperature of 23°C.
- 3.6 The density of insulation shall be 25Kg/m³ or more than specified value for Closed cell Chemical cross linked polyethylene foam (XLPE) and 40-60 Kg/m³ for Nitrile Rubber Thermal Insulation.
- 3.7 The water vapour diffusion resistance shall be more than 54000-60000 following standard BS EN 12086.
- 3.8 The material shall also be UV and Ozone resistant. The joints shall be sealed with self-adhesive tapes (Alupet) of similar specifications.

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3.9 The insulation material shall be fire rated for Class O for Fire propagation test. Fire Spread Index (FSI) should be less than 25 and Smoke Density Index (SDI) should be less than 50.

3.10 Resistance to bacteria and fungi should be excellent on insulation surface accordance. VOC level must be below $4\mu\text{g}/\text{m}^2/\text{hr}$.

3.11 Material should have Environment friendly like Ozone resistance Excellent, Ozone Depletion potential zero and CFC& HCFC, dust, fibres free.

4.0 INSTALLATION PROCEDURE

4.1 The application of insulation shall be made in a professional manner. Duct surfaces shall be cleaned to remove all grease, oil, dirt, etc. prior to carrying out insulation work. The insulation shall be applied to all surfaces when these are at ambient temperature. Ample provision shall be made for the maximum possible thermal movement and the insulation shall be applied in a manner which shall avoid breaking or telescoping due to alternate periods of contraction and expansion. A single layer of insulation shall not be more than 75 mm thick.

4.2 Measurement of surface dimensions shall be taken properly to cut closed cell elastomeric rubbers sheets to size with sufficient allowance in dimension. Material shall be fitted under compression and no stretching of material should be allowed. A thin film of adhesive shall be applied on the back of the insulating material sheet and then on to the metal surface. When adhesive is tack dry, insulating material sheet shall be placed in position and pressed firmly to achieve a good bond. All longitudinal and transverse joints shall be sealed as per manufacturer recommendations. The adhesive shall be strictly as recommended by the manufacturer. The detailed Application specifications are as per the manufacturer's recommendation.

4.3 Insulation shall be applied after all leak tests on equipment and piping is over and the section of the plant has been specifically released by the PURCHASER for such work. If insulation has to be applied before the leak test, all welded and flanged joints shall be left exposed and insulated after satisfactory completion of the leak test.

4.4 All surfaces to be insulated shall be clean and dry before the insulation is applied. The surfaces shall be cleaned of all foreign material such as scale, dirt, rust and paint, using steel wire brushes and steel scrapers, where necessary. Where a surface is not free of paint the

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CONTRACTOR shall notify the PURCHASER of the condition for remedial action. The insulation shall be applied after remedial action, suggested by the PURCHASER, has been taken by the CONTRACTOR. One coat of primer paint shall be applied and allowed to dry before application of insulation.

- 4.5 Refrigerant pipe insulating material in tube form shall be sleeved on the pipes. On existing piping, pre-slit, pre-glued tubes shall be placed. The slit ends of the tube shall be joined by removing the release paper. The sleeves shall be sealed from both the ends and at the butts by strictly by manufacturer recommended adhesive. Wherever flat sheets shall be used it shall be cut out in correct dimension All longitudinal and transverse joints shall be sealed as per manufacturer recommendations. The insulation shall be continuous over the entire run of piping, fittings and valves.
- 4.6 After cleaning and application of one coat of primer paint on the surface to be insulated only, the insulation adhesive shall be applied for fluid operating temperatures between 200C and (-) 200C. Insulation material of required thickness shall be stuck to the surface with joints staggered. The adjoining sections shall be tightly pressed together. All the joints shall be sealed with adhesive material. Voids, if any, shall be packed with suitably cut pieces of insulation material. Vapour barrier and insulation finish shall be applied as per paras 3.4 and 3.5 or 4.5 respectively.
- 4.7 For fluid operating temperatures below (-) 200C, the insulation shall be applied directly over the surface to be insulated without applying the insulation adhesive. Vapour barrier shall be applied over the insulation material. Vapour barrier and insulation finish shall be applied as per paras 3.4 and 3.5 or 4.5 respectively.
- 4.8 Where multilayer insulation is provided, insulation adhesive shall be used between two layers, based on temperature criterion given in para 4.1.4.
- 4.9 If aluminium or GS sheet is specified as finishing material, all joints shall be sealed with bitumastic paint and made effectively weather and water-proof. For temperatures between (-) 40 and (+) 120oC, MAS 94 may also be used as sealant. MAS 94 shall, however, not be used with polystyrene as insulation material. All flat surfaces shall be adequately sloped to prevent pools of water.
- 4.10 Depending on the type of insulation material used and the operating temperature, contraction joints shall be provided for equipment or pipes to prevent rupturing or buckling

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when the cold surface contracts.

4.11 ADHESIVE FOR DUCT/PIPE APPLICATION

The Adhesive shall be strong bonding, high coverage, synthetic in nature, suitable for use on any substrate and with any type of Insulating material. The Adhesive shall be free of lead, asbestos, benzene & mercury. The Adhesive should be easy to apply with brush. The Adhesive shall be free of obnoxious or repelling odour. Certificate to be issued by the Adhesive manufacturer for no added "Benzene free claim". The adhesive shall have minimum tear strength resistance of > 20 N / 25 mm when tested as per AFERA – 4001. The adhesive shall be quick drying characteristics for tropical conditions and shall have service temperature of 0 OC to +85 OC.

4.12 INSTALLATION OF DUCTS & PIPE EXPOSED DIRECTLY TO SUNLIGHT:

Protective Coating shall be an exterior grade flexible, fire resistive fungicidal resistant compound suitable for vapor sealing of any type of insulating material even for external ducts and pipes. The Coating has to be Industrial grade coating conform to chemical resistance, backed by necessary third party certificates. The coating should have excellent resistance to Water Vapour and Rain water resistance and should conform to ASTM 96 and ASTM D 6904. The coating should be Antifungal and Anti Algal and has to conform to ASTM G21, ASTM D 3273 and ASTM D 5589. When tested for surface burning characteristics in compliance with ASTM E-84, flame spread shall be less than 5 and smoke developed less than 10. The Protective Coating shall conform to ASTM D6695 for Weathering Resistance and not only just UV resistant. The Protective Coating shall be applied with 2 coats – one on the insulated surface along with 10 mil Fibre Glass Cloth / Canvass Cloth and second coat above the Fibre Glass Cloth / Canvass Cloth. The Protective Coating should be easy to apply with brush or hand and must have good hiding properties with maximum of 2 coats.

5.0 ACOUSTIC LINING

- 5.1 Where stipulated the supply air ducts – whether of masonry or sheet metal – shall be lined acoustically 15 mm thick Open Cell Nitrile Rubber Insulation Sheet (density 140 - 160 kg/m³) on one side. The density of the material used shall be 48 kg/cum.

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- 5.2 The Open Cell Nitrile Rubber Insulation Sheet shall be fixed to the inner surface of the duct. It should have Microban; antimicrobial product protection and should pass Fungi Resistance as per ASTM G 21 and Bacterial Resistance as per ASTM E 2180.
- 5.3 The material should have a thermal conductivity not exceeding 0.047 W/m.K @ 20 Deg. C. The material should withstand maximum surface temperature of +85°C and minimum surface temperature of -20°C. The material should conform to Class 1 rating for surface spread of Flame in accordance to BS 476 Part 7 & UL 94 (HBF, HF 1 & HF 2) in accordance to UL 94, 1996.
- 5.4 The joint between the sheets shall be sealed using PVC adhesive tapes.
- 5.5 Air tight boxing for indoor units with proper supports and 25 mm acoustic insulation on the inner surface wherever required as per site condition like outside area to have proper return air provision.
- 5.6 After the air distribution system is completed in all respects, all ducts shall be treated for air leaks.
- 5.7 Before painting the interiors of conditioned spaces air distribution system shall be allowed to run continuously for 48 hours for driving away any dust particles or foreign material ingress / logged within ducts during installation. The entire air distribution system shall be balanced using a hot wire anemometer. Measured air quantities at for discharge and at various outlets shall be identical to or less than 5% in excess if those specified and quoted. Leakage in each air distribution system shall be identical and not greater than 3% in of the total air quantity measured at all supply outlets served by the fan. Branch duct adjustments shall be made by volume control dampers or splitter dampers. Dampers shall be permanently marked after air balancing is complete so that these can be restored to their correct position if distributed at any time. Complete air balance report shall be submitted to the consultants/site supervisor for scrutiny and approval, and provided with complete handing over documents.
- 5.8 ACOUSTIC LINING OF MECHANICAL ROOMS
- Two walls and ceiling of air conditioning plant room and air handling unit rooms may be provided with acoustic lining. The recommended insulation thickness is 30 mm.
- Installation Procedure:** The wall surface shall be cleaned and required surface preparation shall be done for applying adhesive. Rubber based contact adhesive recommended by the manufacturer shall be used. The foam sheets shall be cut to required size and a thin layer of adhesive shall be applied to both the surfaces and wall . When it is tack dry, it is should

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applied / stuck with enough pressure to the walls/ceiling. Minimum 5 fasteners with washer (of G.I Sheet 2.5 inch x 2.5 inch) / square meter, 4 at corners & 1 at centre shall be put immediately after sticking with the help of adhesive. The length of the fastener should be minimum 75 mm.

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**STANDARD TECHNICAL SPECIFICATION
FOR
REFRIGERANT**

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1. SCOPE

This specification covers the general design, materials, manufacture, shop inspection and testing at manufacturer's works, delivery at site, handling at site, erection, testing, commissioning, performance testing and handing over of refrigeration piping system and accessories.

2. LIST OF INDIAN STANDARDS CODES

The design, materials, manufacture, erection, inspection, testing and performance of refrigeration piping system shall comply with all currently applicable statutes, regulations and safety codes in the locality where the system is to be installed. The system shall also conform to the currently applicable Indian and international codes and standards. Nothing in this specification shall be construed to relieve the vendor of this responsibility. Following are some of the applicable codes and standards:

ANSI B31.5	Refrigeration Piping
ASHRAE 15	Safety Code for Mechanical Refrigeration
ASTM A106	Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A333	Seamless and Welded Steel Pipe for Low-Temperature Service
IS 10773	Wrought Copper Tubes for Refrigeration and Air-Conditioning Purposes

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3. DESIGN REQUIREMENTS

- 3.1 Suction line sizing shall be such that the total loss in pressure is approximately equivalent to 1°C drop in saturation temperature for halogenated hydrocarbon refrigerants and not over 0.5°C for ammonia. Low temperature installations shall allow lower pressure drop than these figures. Suction lines shall be checked for minimum tonnage capacity of the piping for oil return to the compressor.
- 3.2 Discharge lines shall be sized so that the total loss in pressure is approximately equivalent to 0.5 to 1°C drop in saturation temperature.
- 3.3 Liquid lines shall be sized on the basis of a velocity of 0.5 meters/sec. Lower velocities may be used in smaller sizes of liquid lines. Vapour equalizing lines shall be provided from top of receiver to the top of condenser, if 0.5 meters/sec is used as the design velocity for liquid line from condenser to receiver.
- 3.4 The piping shall be designed for an internal pressure representing the most severe condition of coincident pressure and temperature expected in normal operation including fluid head.
- 3.5 Fittings, flanges and pipe joints shall conform to the requirements of ANSI B31.5.

4. Tests

Test pressure for piping shall be 1.1 times of design pressure.

The pressure shall be gradually increased until a gauge pressure, which is the lesser of one-half of the test pressure or 1.75 Kg/cm²g is attained and preliminary leak checks shall be carried out. Thereafter, the pressure shall be gradually increased in steps until

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the test pressure is reached. The pressure shall then be reduced to the design pressure and leakage examination shall be made. The design pressure shall be maintained for 48 to 72 hours.

A pressure relief valve/device shall be provided on test pressure line having a set pressure slightly above the test pressure.

Nitrogen shall be used as test medium.

Oxygen or any combustible mixture of gases shall not be used as test medium. Water or water solutions shall not be used as test medium

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STANDARD TECHNICAL SPECIFICATION
FOR
AIR DISTRIBUTION SYSTEM

Contents

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- 9. Jet Nozzle/Diffuser/Drum louver**
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1. SCOPE

This specification covers the general design, materials, construction features, manufacture, shop inspection and testing at manufacturer's works, delivery at site, handling at site, installation, testing, commissioning and carrying out performance test at site of Air Distribution System.

2. CODES AND STANDARDS

The design, materials, construction features, manufacture, inspection, testing and performance of air distribution system shall comply with all currently applicable statutes, regulations, codes and standards in the locality where the system is to be installed. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility. In particular, the air distribution system shall conform to the latest edition of following standards.

The construction, erection, testing and performance of the ducting system shall conform to the SMACNA - 2005 THIRD EDITION STANDARDS (HVAC DUCT CONSTRUCTION STANDARDS - METAL & FLEXIBLE – SECOND EDITION – 2005* - SMACNA).

IS 277	Specification of plain and corrugated galvanized steel sheet
IS 655	Material and construction requirement for air duct.
IS 737	Wrought Aluminum and Aluminum Alloy Sheet and Strip for General Engineering Purposes
SMACNA	HVAC Duct Construction Standards - Metal and Flexible
ANSI/SMACNA 016	Leakage criteria and testing procedure
SMACNA Dampers	HVAC Systems - Testing, Adjusting and Balancing UL 555 Fire
ASHRAE 70 Inlets	Method of Testing for Rating the Performance of Air Outlets and
IS 9844	Methods of testing corrosion resistance of electroplated and anodized aluminium coatings by neutral salt spray test

3.0 DUCT CONSTRUCTION FEATURES

- 3.1 Ducting shall be fabricated from Galvanized Steel Sheets (GSS) or Aluminum (AL) sheets or Stainless Steel (SS) sheets unless specified.
- 3.2 GSS shall be of lock-forming grade, zinc coated conforming to IS 277 coating grade 200 or better.
- 3.3 AL sheets shall be of grade 31000 as per IS 737. SS sheets shall be of SS 304 as per ASTM A167.
- 3.4 All the ducts shall be of LFQ (Lock Forming Quality) grade prime G.I. raw material furnished with accompanying Mill Test Certificates. Galvanizing shall be 275 gms/sq.m. (total coating on both sides). The G.I. raw material should be used in coil-form (instead of sheets) so as to limit the longitudinal joints at the edges only, irrespective of cross-section dimensions.
- 3.5 Governing Standards Unless otherwise specified here, the construction, erections, testing and performance of the ducting system shall conform to the SMACNA standards and Addendum of SMACNA.
- 3.6 All the transverse duct connectors (Flanges\Cleats) and accessories related hardware such as support system shall be zinc coated (galvanized).
- 3.7 All the duct work including straight sections, tapers, elbows, branches, shoe pieces, collars, terminal boxes and other transformation pieces shall be factory fabricated. Equivalency will require fabrication by utilizing the following machines and process to provide the requisite quality of ducts and speed of supply.
- 3.8 All ducts, transformation pieces and fittings shall be made on CNC profile cutters for required accuracy of dimensions, location and dimensions of notches at the folding lines. All edges shall be machines treated using lock-formers and rollers for turning up edges.
- 3.9 Duct construction shall follow for required static norms as per SMACNA. All transverse connectors shall be 4-bolt system. To avoid any leakage additional sealant shall be used. The specified class of transverse connectors and duct gauge for a given duct dimensions

shall be as per required pressure class. Non-toxic, AC-application grade P.E. or PVC gasketing shall be provided between all mating flanged joints. Gasket sizes shall conform to flange manufacturer's specification.

3.10 Duct construction & fabrication

The fabricated duct dimensions shall be as per approved drawings and all connecting sections shall be dimensionally matched to avoid any gaps. All fabricated dimensions shall be within + 1.0mm of specified dimension. To obtain required perpendicularity, permissible diagonal tolerance shall be +1.0mm per meters. Each duct pieces hall is identified by coded sticker, which shall indicate specific part number, job name, drawing number, duct sizes and gauge. Ducts shall be straight and smooth on the inside. Longitudinal seams shall be airtight. Changes in dimensions and shape of ducts shall be gradual (between 1:4 and 1:7). Plenum shall be factory fabricated panel type and assembled at site.

Sheet gauges shall be as follows:

- Rectangular Duct:

S. No.	Maximum Duct Size (mm)	Minimum sheet thickness (mm)
1	Up to 750	24 Gauge
2	750 – 1500	22 Gauge
3	1501-2200	20 Gauge
4	Above 2200	18 Gauge

- Round Duct:

S. No.	Maximum Duct Size (mm)	Minimum sheet thickness (mm)
1	Up to 700	24 Gauge
2	750 – 1000	22 Gauge
3	1000 - 2200	20 Gauge

4	Above 2200	18 Gauge
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Note : TDF flange for duct up to 20G & MS angle flange for ducts 18G and above.

Note : Above table is provided minimum gauge requirement for normal pressure range below 100mm WC. Any system having pressure higher than this vendor to do required design changes according to SMACNA/ IS655.

4.0 SUPPORTS

All ducts shall be supported from the ceiling / slab by means of MS rods with MS angle of suitable size at the bottom with neoprene pad in between the duct & MS angle. The ducts shall be suspended from the ceiling with the help of dash fasteners. Provision for necessary ancillary materials required for hanging the ducts shall be arranged by the contractor. The supports shall be taken independently to the building structure, in other words they should not be tied on to supports for light fixtures.

- 4.1 All duct joints shall be made right and the interior surfaces shall be smooth. Necessary gaskets of rubber or similar material shall be used to secure tightness of joints.
- 4.2 All MS angles, flats etc., used for flanges, stiffening, etc., shall be finished with two coats of Aluminium paint. These requirements shall apply to supporting arrangements / members also.
- 4.3 Minimum thickness of structural members employed for supports shall be as per IS800.
- 4.4 The flexible joints shall be fitted to the delivery side of AHU fans with Fire Retardant Double canvass. The length of flexible joints should not be less than 150 mm and not more than 300 mm between faces.
- 4.5 Where ducting is supported from ceiling / roof slab, Anchor grip bolts shall be used to fasten the suspension rods (for duct supports) to the ceiling / roof slab.
- 4.6 All civil works involved including the drilling of holes for fixing the grip bolts and any chipping and finishing of the ceiling / roof slab, if found unavoidable, shall be carried out by the successful contractor at no extra cost.

- 4.7 Elbows, bends, offsets etc., should be fabricated with a width to radius ratio of not less than 1.0 to 1.5

5.0 DIFFUSERS , GRILLS AND DAMPERS

- 5.1 All supply air diffusers shall be of powder coated extruded aluminium sections and removable core type. Volume control dampers shall be provided for all diffusers.
- 5.2 Return air diffusers shall be identical to supply air diffusers except that they do not incorporate volume control dampers.
- 5.3 The ceiling type diffusers shall be of 1.25 mm (18 gauges) aluminum sheets.
- 5.4 Supply air grilles shall be double deflection type & of powder coated extruded aluminium construction. They shall be complete with Volume control dampers of aluminium mounted on grilles. The vanes at the front shall be horizontal while those rears shall be vertical. The width of the perimeter flanges shall be 32 mm. the vanes shall be 3 mm thick and 25mm deep.
- 5.5 The grilles shall have opposed blade dampers of M.S. Black sheets, which shall be key operated from the grille face wherever required as approved. The damper blades shall be of 0.63 mm (24 gauge) M.S. Black sheets and shaped to form air tight joints. The frame work for dampers shall be fabricated from 0.63 mm (24 gauge) M.S. Black sheet.
- 5.6 Return air grilles shall also be powder coated extruded aluminium construction. They shall incorporate (only) horizontal vanes, which shall be fixed. The perimeter flanges shall be 32 mm width. The vanes shall be 3 mm thick and 25mm deep. The pitch of vanes shall be 20mm.
- 5.7 All dampers shall be louvered dampers (of GI) of robust construction and tightly fitted in epoxy painted MS angle iron frame. They shall be provided with suitable links, levers and quadrants as required for their proper operation, control or setting in any desired positions. Dampers and their operating devices shall be made robust, easily operable and accessible through suitable access doors in the ducts / false ceiling. Where required, dampers shall have an indicating device, clearly showing the damper position at all times. Damper to be provided with extended lever for future installation of actuator.

- 5.8 Dampers shall be placed in ducts and at every branch (whether or not indicated on the drawings) for the proper volume control and for balancing the system. Dampers shall be two gauges heavier than gauge of the large duct, and shall be rigid in construction to the passage of air.
- 5.9 All sheet metal connections, partitions and plenums required to confine the flow of air to and through the filters, fans etc., shall be constructed of 18G sheets, thoroughly stiffened with 25 m x 25mm angle iron braces and fitted with all necessary doors as required to give access to all parts or apparatus. Door shall not be less than 450 mm x 600 mm in size. Where sheet metal ducts or sleeves terminate in wood work, brick or masonry openings, tight joints shall be made by means of closely fitted heavy flanges collars.
- 5.10 Connection of ducts to fans shall be of suitable flexible synthetic material.
- 5.11 All MS / Al. dampers shall be of robust construction and tight fitting. The design, method of handling and control shall be suitable for the locations and service required. The blades of Al construction damper shall be of aero foil design and leak proof. Suitable sturdy gears shall be used for long life.
- 5.12 Dampers shall be provided with suitable links, levers and quadrants as required for their proper operation, control or settings devices shall be made robust easily operable and easily accessible through suitable access door in the ducts.
- 5.13 Dampers shall be placed in ducts & at every branch supply or return air ducts connections, whether or not indicated in drawings for the proper volume control & the balancing of system.
- 5.14 Round or rectangular diffusers shall be of powder coated extruded aluminium construction, square, or round diffusers with removable core or adjustable flow pattern.
- 5.15 After completion of the duct work, dampers are to be adjusted and set to deliver the required amounts of air as specified on the drawings.
- 5.16 All damper (Manual/motorized) to be provided with necessary extended sleeve/shaft

for motorized operation.

6.0 FIRE DAMPERS

- 6.1 The fire dampers shall be provided in all the main supply and return air ducts whether shown in the drawings or not as per NFPA90A. Fire dampers to be provided for floor penetration or fire wall penetration. Fire dampers shall be motor operated with at least 90 minutes fire rating as per UL 555-1995 as tested CBRI Roorkee, India.
- 6.2 Fire dampers shall be multi leaf type. The blades and outer frame shall be made of 16G galvanized steel sheet. Fire damper assembly shall be factory fitted in a sleeve made of 16G galvanized steel sheet of minimum 400mm long. The blades shall be pivoted on both sides using chrome plated spindles in self lubricated bronze bushes. Metallic compression seal shall be provided on both ends to prevent smoke leakage. Stop seal shall be provided on top & bottom. Dual side linkage shall be provided for better structural stability. The construction of the fire damper shall allow maximum free area to reduce pressure drop and noise in the air passage. Necessary extended sleeve to be provided for motorized operation.
- 6.3 Every motorized fire damper/smoke and fire damper shall be tested in the factory and will be certified by the manufacturer in form of the test certificate. Actuator should design to sustain high temperature as per UL555S. Damper Rated for 720C (UL stamped)
- 6.4 Fire damper shall also be supplied with spring locked fusible link to close fire damper in event of rise in duct temperature. Fusible link should not be melted below 74 Deg C. damper rated for 720C (UL stamped). Fusible link Fire damper to have limit switch to convey the close position of damper to control panel.
- 6.5 The actuator used shall be maintenance free direct coupled spring return type suitable to work on 24V electric supply. The torque rating of the actuator shall exceed at least by 15% over torque required to open/close the damper. The selection of actuator size shall be the responsibility of the manufacturer of the fire damper. Spring return time shall be 20 seconds or less at ambient temperature. The tamper proof housing with IP-54 protection rating.

6.6 The control panel shall have at least following features:

- Power on indicating lamps with 230V/24V Transformer.
- Damper close & open indication
- Rest push button
- Push button for manual running of actuator for periodic inspection.
- Auxiliary contacts 24V & 230V
- Contact points to receive signal from smoke defector/fire alarm panel.
- Access door will be provided in the duct before each fire damper.

7.0 LOUVERS

7.1 The louvers shall consist of parallel metallic blades. The louvers shall be provided with fixed type blades or adjustable opening type blades as specified in data sheet A.

7.2 The width and angle of blades shall be such as to minimize the entry of water and snow inside. The minimum percentage of free area shall be 35% to 37%. The minimum projected width of blades in horizontal plane shall be 150 mm with the blades inclined at minimum 35 degrees. The blades shall be overlapping each other with maximum 30 mm height in vertical plane between two blades. Blades shall be bent back at edges and ridged to provide stiffness and prevent water from travelling up. Width of one bank of louvers shall be 1000 mm maximum. In case width is more, mullions shall be provided to restrict width to less than 1000 mm.

7.3 For adjustable type louvers, mechanism of blade angle adjustment shall be designed in such a manner that maximum effort required shall not exceed 20 Kgf.

7.4 The blade linkage rod shall be of cold rolled steel and minimum 8 mm diameter. The number of blade linkage rod shall be one (1) for every 1000 mm width of louvers or part there-of.

7.5 The louvers shall be located at a minimum 350 mm height above the ground or roof level to minimize the pick-up of dust and the probability of snow piling up and

subsequently entering the louver during winter operation. The louvers shall be in such a manner that cross contamination from other exhaust does not occur.

- 7.6 SS304 Bird/Insect screen of 10 mm² and minimum 16 G wire mesh shall be provided at intake and exhaust air louver.
- 7.7 The frame of louver shall have a sill extension of 50 mm to provide drip ledge so that rainwater drains outside.
- 7.8 The frame of fresh air louver shall have suitable framework for installation of filter and damper.

8.0 ACOUSTIC LINING:

Where stipulated the supply air ducts – whether of masonry or sheet metal – shall be lined acoustically using 25 mm thick rigid fibre glass boards or open cell rubber with black fibre glass tissue facing on one side. The density of the material used shall be 48 kg/cum.

The rigid fibre glass boards shall be fixed to the inner surface of the duct so that the plain fibre glass finish facing will be in contact with sheet Metal Ducting while the face with black fibre glass tissue facing will be in contact with air. The boards shall be fixed using GI bolts, nuts & Washers.

The joint between the boards shall be sealed using PVC adhesive tapes.

Cover the insulation with 26G perforated aluminium sheet using GI bolts, nuts & washers.

The surface of the AHU Room shall be cleaned from all dirt/cement dusts and will be painted with two coats of bituminous primer. TW plugs of 50x50x25 mm deep shall be provided at 1 M intervals using a grid work of 600 x 600 mm GI Channels of 50x50x50mm size. The channels shall be fixed to the wall using GI screws. 50 mm fiberglass mats shall be inserted into the framework and shall be covered with RP tissue. Perforated sheet of 24 G shall be fixed on the top of the RP tissue using GI screw and washers to make sure that the surface of the AI sheet should be taut and free of waviness.

After the air distribution system is completed in all respects, all ducts shall be treated for air leaks.

Before painting the interiors of conditioned spaces air distribution system shall be allowed to run continuously for 48 hours for driving away any dust particles or foreign material ingress / logged within ducts during installation. The entire air distribution system shall be balanced using a hot wire anemometer. Measured air quantities at for discharge and at various outlets shall be identical to or less than 5% in excess if those specified and quoted. Leakage in each air distribution system shall be identical and not greater than 3% in of the total air quantity measured at all supply outlets served by the fan. Branch duct adjustments shall be made by volume control dampers or splitter dampers. Dampers shall be permanently marked after air balancing is complete so that these can be restored to their correct position if distributed at any time. Complete air balance report shall be submitted to the consultants/site supervisor for scrutiny and approval, and provided with complete handing over documents.

9.0 JET NOZZLE / JET DIFFUSERS / DRUM LOUVERS

Drum Louvers / Jet Nozzles shall be used for spot cooling applications and air distribution at a height more than 5mtrs.

Vendor to select the type of drum louver or jet nozzle based on the flow rate per spot as per the ducting layout.

Drum louver / Jet nozzle are suitable for horizontal or vertical duct mounted type.

Drum louver / Jet nozzle are suitable to fix the angle of air throw at site with locking arrangement.

Drum louver / Jet nozzle shall be provided with individual control dampers (either unit mounted, or duct mounted at tapping point). However, the BOQ line item shall include the drum louver /jet nozzle with control damper as one item.

Jet nozzle shall be aerodynamically designed eye ball type nozzle deep drawn in one single piece with discharge nozzle and face cover ring of specified spigot diameter and

shall be made of Aluminium. The nozzle shall be manual swivel and rotate type with rotation of the nozzle up to 30° in one plane. The nozzle housed in a specially designed housing with a mounting flange with holes for fastening the nozzle and aesthetic trim ring with snap locking arrangement to cover fasteners and give blemish free appearance.

Sr No	Description	Specification
1	Type	Jet Nozzle / Drum Louver
2	Draft / Throw	Min 10 mtr
3	Material of Construction	Extruded Aluminium
4	Finish	Powder Coated
5	Deflection	Side 30 Deg
6	Noise Level	25- 30 NC
7	Damper MOC	Aluminium (Colour shade Matching with Diffuser)

10.0 VAV Boxes (with electric heater)

Materials:

Casing in galvanised sheet steel, aluminium sensor tubes and blades, gear wheels made of antistatic plastic (ABS), heat resistant up to 50 °C. Selection based on duct dimensions. Simple setting by the customers of the volume flow with Vmin and Vmax adjustment potentiometers with percentage scales. During the installation or commissioning of controller, adjustment is possible without supply voltage. The controlled is to have a transparent protection cover that prevents inadvertent resetting and provides general security. The control damper blade shall be delivered in a 45° position to allow ventilation air flow without additional control functions required characteristics:

- Flow rate adjustment without adjustment tool
- Functional testing with service button
- Functional check by indicator light
- Factory functional testing of each unit using a dedicated test rig

- High visibility external indicator light for signaling the functions: (Set, not set and power failure).

VAV shall be pressure independent type designed to deliver consistent air flow to space and independent to duct pressure variation. This is achieved using flow controller that adjust flow based on demand from the space.

Functional testing of actuator 'CLOSED, OPEN and control operation shall be possible with service button. Electrical connections with screw terminals, terminal for looping the supply voltage (24 V shall be acceptable), i.e. for the connection of simple voltage transmission to the next controller. Wire clamping bracket fixed to the casing. Voltage range for control and actual value signal 0 to 10 VDC.

Possible override controls with external switches using potential free contacts: CLOSED, OPEN, Vmin or Vmax.

The price quoted for all the VAV boxes shall include allowance for the electrical power supply system to the VAV boxes which shall be taken from an adjacent suitable essential powered isolator (as provided in the electrical volume of this project). The electrical power supply system to all VAV boxes is to be designed and installed as part of the scope of works of this work package.

General requirements for project:

All VAV boxes shall be insulated with factory fitted acoustic and thermal insulation which shall be 40 mm thick or more to avoid condensation.

11.0 FLEXIBLE CONNECTIONS (Metal Duct connections to Supply / Exhaust Fan)

Wherever sheet metal duct connects to the intake or discharge of fan units, a flexible of fire retarding double layer heavy duty canvas of at least 150mm width shall be provided.

The material shall be attached to angle frames by means of steel and over the end of the flexible connection. The material shall be secured between the band and the angle frame by bolting.

Sleeve shall be made smooth and the connecting duct work rigidly held by independent supports on both ends. The flexible connection shall be suitable for fan intake and outlet pressures.

12.0 INSPECTION AND TESTING

The ducts, branches, bends etc. shall be inspected and the joints and connection shall be checked before these are assembled in position. After assembly the system shall be checked for tightness, vibration and noise.

13.0 BALANCING

The air distribution system shall be tested and balanced so that the requisite temperature and air flow are maintained throughout the space to be air-conditioned or ventilated. Complete air balance report shall be submitted for scrutiny and approval. Splitter damper and VCD adjustments shall be permanently marked after air balancing is complete so that these can be restored to their correct position if disturbed at any point of time.

Comply with current editions of all applicable practices, codes methods of standards prepared by technical societies and association including:

ASHRAE :2007 HVAC Application.

SMACNA :Manual for the balancing and adjustment of air distribution system.

PERFORMANCES

- a. Verify design conformity. (It is vendor responsibility to achieve all desired parameter of equipment as per stated and the Room Temperature should be as per requirement)
- b. Establish fluid flow rate, volumes and operating pressures.
- c. Take flow reading at each room/air outlet.
- d. Establish operating sound and vibration levels.
- e. Adjust and balance to design parameters.
- f. Record and report results as per the formats specified.

14.0 MEASUREMENTS FOR DUCTING

- Unless otherwise specified, measurements for ducting for the project shall be on the basis of center -line measurements described herewith:
- Duct Work shall be measured on the basis of external surface of ducts. Duct measurements shall be taken before application of the insulation. The external surface area shall be calculated by measuring the perimeter comprising overall width and depth, including the corner joints, in the center of each duct section, multiplying with the overall length from flange face of each duct section and adding up areas of all duct sections. Plenums (if any) shall be measured in similar manner.
- For tapered rectangular ducts, the average width and depth shall be considered for perimeter, whereas for tapered circular ducts, the diameter of the section midway between large and small diameter shall be adopted, the length of tapered duct section shall be the center line distance between the flanges of the duct sections.
- For special pieces like bends, tees, reducers, branches and collars, mode of measurement shall be identical to that described above using the length along the center line. NO IS Measurement are permitted for ducting & Insulation.
- The quoted unit rate for external surface of ducts shall include all wastage allowances, flanges and gaskets for joints, nuts and bolts, hangers and angles with

double nuts for supports, rubber strip 3 mm thick between duct and support, vibration isolator suspension where specified or required, inspection chamber / access panel, splitter damper with quadrant and lever for position indication, turning vanes, straightening vanes, and all other accessories required to complete the duct installation as per the specifications. These accessories shall not be separately measured nor paid for. Special items for air distribution shall be measured by the cross-section area perpendicular to air flow, as identified herewith:

- Grilles and registers – Width multiplied by height. (Excluding flanges) Volume control dampers shall form part of the unit area for registers and shall not be separately accounted.
- Diffusers – cross section area for air flow at discharge area, excluding flanges. Volume control dampers shall form part of unit rate for supply air diffusers and shall not be separately accounted.
- Fire dampers – shall be measured by their cross-sectional area perpendicular to the direction of air flow. Quoted rates shall include the necessary collars and flanges for mounting, inspection pieces with access door. No special allowance shall be payable for extension of cross section outside the air stream.
- Flexible connections – shall be measured by their in linear measurement per running meter basis. Quoted rates shall include the necessary mounting arrangement, flanges, nuts and bolts and treated-for-fire requisite length of canvas cloth.

15.0 DATA TO BE FURNISHED AFTER THE AWARD OF CONTRACT

15.1 Quality Assurance Plan (QAP)

15.2 General arrangement drawing showing all diffusers, grilles, dampers, fire dampers, plenums, hoods, access doors, flexible connections and all other accessories. Duct supports and transverse joint locations shall be marked on the drawing.

15.3 Cross-sectional drawings of volume control dampers, fire dampers, access doors etc.
with part list, materials of construction and installation details.

15.4 Datasheet and catalogue

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	STANDARD SPECIFICATION FOR AIR HANDLING UNIT	

STANDARD TECHNICAL SPECIFICATION
FOR
AIR HANDLING UNIT

Contents

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1.0 SCOPE:

- 1.1. This specification covers the general design, materials, construction features, manufacture, shop inspection and testing at manufacturer's works, delivery at site, handling at site, installation, testing, commissioning, performance testing and handing over of AHU/MAU/FAU/RAU units.
- 1.2. Scope covers all mechanical component of air handling unit along with its electrical panel, internal sensors, necessary ports for gauges, doors for maintenance, flexible connections, vibration isolators, internal wiring & cabling and control panel.
- 1.3. It covers necessary provision for interlocks with fire damper, fire panel and BMS/PLC system.
- 1.4. The requirements laid down in this specification are the minimum requirements. Nothing herein shall be construed to relieve the CONTRACTOR of their responsibility for ensuring the equipment's full integrity and performance.
- 1.5. Commissioning spares shall be in the scope of supply of Vendor till successful commissioning of plant with product.
- 1.6. The vendor must guarantee that spare parts for the selected equipment model remain available for a long-term duration.

2.0 CODES AND STANDARDS

The design, materials, construction, manufacture, inspection, testing and performance of AHU type air-conditioners shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility. In particular, the AHU type air-conditioners shall conform to the latest editions of following standards:

IS 18794	Specifies performance, rating requirement & method of test for air handling unit
IS 9844	Methods of testing corrosion resistance of electroplated and anodized aluminium coatings by neutral salt spray test
EN1886	AHU casing performance (Mechanical strength, air leakage class)
EN 13053	AHU component performance
IS 7613	Method of Testing Panel Type Air Filters for Air-Conditioning and Ventilation Purposes

ASHRAE 33	Method of Testing - Forced Circulation Air Cooling and Air Heating Coils
IS 17570	Air filters for general ventilation
ASHRAE 52.1	Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter
AMCA	Air movement control association
ARI 430	Central Station Air-Handling Units
AHRI 410	Performance rating of forced circulation air cooling and air heating coils
ASHRAE 15	Safety Code for Mechanical Refrigeration
ASHRAE 37	Methods of Testing for Rating Unitary Air-Conditioning and Heat Pump Equipment
IS 1730	Steel plate, sheet, Strips & flats for general and structural engineering purpose
NFPA 90A	Installation of Air-conditioning and Ventilating Systems
IS 277	Galvanized Steel Sheets (Plain and Corrugated)
IS 655	Metal Air Ducts
IS 737	Wrought Aluminum and Aluminum Alloy Sheet and Strip for general Engineering Purposes.
ANSI B31.5	Refrigeration piping (Current Edition)
OSHA	Occupational Safety and Health Administration Standards
UL 555	Fire Dampers

3.0 CONSTRUCTION FEATURES

- Air handling units shall include the below compartment
 - ❖ Double wall Encloser/ cabinet
 - ❖ Fresh air, return air, supply air opening with dampers
 - ❖ Cooling coil (Not applicable for FAHU)
 - ❖ Heating coil (Not applicable for FAHU)
 - ❖ Electrical heater (Not applicable for FAHU)
 - ❖ Filter (Pre, medium, Fine, HEPA) (As applicable)

- ❖ DIDW centrifugal Fan/ Plug fan (VFD starter in case of plug fan)
- ❖ Mixing chamber
- ❖ Access doors
- ❖ Pressure temperature measuring ports
- ❖ Drain pan
- ❖ Vibration isolators
- ❖ Flexible connection
- ❖ Electrical cum control panel

- Units shall be medium pressure draw through type suitable for outdoor installation.
- Air handling units and coils shall be selected based on the performance requirements required as per heat load calculation.
- Units shall be completely factory assembled, requiring only external connections of electrical power, utility piping, control wiring, and ductwork to provide an operable system.
- Ship large units in sub-sections with bolted and flanged connections.
- Unit inlet and discharge noise shall not exceed 75-dBA sound power level at a distance of 1 meter from the unit connection. If not achieve then vendor has to provide the acoustic enclosure to control the noise level as specified.
- All the internal components should be placed at proper distance between successive components for satisfactory operation, maintenance & performance.

4.0 MATERIALS AND FABRICATION

4.1 Base Unit:

- Cabinet shall be constructed of double wall construction with 20/22G or better galvanized steel exterior. Exterior shall be preplastisized/ pre-coated 275 gsm. Inside skin of panel shall be made of minimum 20/22G or batter plain galvanized steel sheet.
- Cabinet panels shall be fully insulated with 50 mm thick PUF insulation 40 KG/M3 with thermal break profile. In case of fire proof design requirement insulation shall be of rockwool with same thickness. For fresh air unit (without cooling coil) insulation thickness shall be 25 mm PUF and thermal break profile is not required.

- The panels shall be mounted using SS screws onto 1.6 mm thick extruded aluminium-alloy box section/channel frame or galvanized steel frame with suitable height legs for adequate U-trap for the AHU static pressure rating.
- Interior shall be sealed with silicone sealant to provide water tight liner so that interior can be cleaned.
- Unit shall contain standard 18G SS 304 insulated drain pans under coil section. Drain pans shall have connections on right and left sides of unit to facilitate field connection. Drain pans shall have the ability to be sloped toward the right or left side of the unit to prevent standing water from accumulating in pans. Drain pan shall be insulated.
- Unit shall come with removable lifting plugs.
- Unit shall come with access doors between each section. The access doors shall have 20G galvanized steel interior liner and exterior. Door handles shall be poly carbonate construction with stainless steel hinges. Each door shall have 200 x 200 mm plastic viewing window. All access doors shall be operating against unit static pressure. All Doors to be provided with limit switches and the same shall be interlocked with fan operation.

4.2 FAN

- Blower shall have DIDW (Double inlet Double width) type forward/backward curved blades centrifugal direct drive or plug fan shall be selected for minimum efficiency of 75%. Fan casing and wheels shall be made of galvanized steel sheet. Fan shaft shall be of grounded C40 C.S or Solid steel supported in self-aligning plummer block operating less than 75% of first critical speed. Heavy duty pillow block type, self-aligning, grease lubricated ball bearings shall be used. Bearing shall be sized to provide a life of 200,000 hours Suitable springs and Entire fan and fan motor to be vibration isolated from unit casing with spring isolators. Fans shall be selected for high efficiency and low noise level. Fan assemblies shall be statically and dynamically balanced as per relevant ISO/AMCA standard. Fan selection sheet shall be submitted along with the offer. The balance testing including the final trim balance shall be done at the factory prior to shipment.
- Fan shall be AMCA certified.
- Fan shaft shall be ground and polished to correct tolerance to prevent slipping or shaft cutting by fan wheel or drive sheave. The fan wheel shall be keyed to the shaft and properly secured with set screws or drive sheave. The fan wheel

shall be keyed to the shaft and properly secured with set screws or lock nut. The drive end of the shaft shall be milled and fitted with key at the factory.

- Fan shall be direct driven with motor shaft. Provide OSHA approved fan guard along with aluminum wire mesh for protection at access panel.
- Motor shall be high efficiency IE3 type suitable for Power supply 3 Phase, 415V $\pm 10\%$, 50Hz $\pm 5\%$, combined voltage and frequency variation $\pm 5\%$.

4.3 COOLING COIL (Not applicable for fresh air unit)

- The cooling coils shall be designed for Chilled water. Cooling coils shall consist of 6 (min.) to 10 rows deep of copper at manufacturer's discretion, 12.5 - 15 mm diameter with 0.5mm thick minimum sine-wave aluminium fins bonded to the tubes by mechanical expansion. The in/out headers shall be stainless steel. Chilled water supply & return connections protruding out of AHU casing by minimum 150 mm. Coils shall be capable to have right hand or left hand connections. To be decided before releasing GA drawings for construction.
- Chilled water coils shall be rated for an operating pressure of not less than 10 Bar or better.
- Chilled water coil with hydrophilic coating for clean room Equipment only.
- The coil face velocity shall not exceed 450FPM. Fins shall be firmly bonded by hydraulic expansion or passing bullets for contacts fins & maximum contact in between foot of fins & tubes.
- Coils shall have maximum 4 to 12 fins per 25 mm; Fins to be selected based on air flow & inside temperature requirement.
- Coils shall be multiple in stacked arrangement. Also, intermediate drain pan after each coil shall be provided(Refer Fig. 4 for Typical Intermediate pan). Moisture carry over eliminators shall be provided.
- Cooling coil for MAU/TFA to be sized to cater 100% fresh air load.

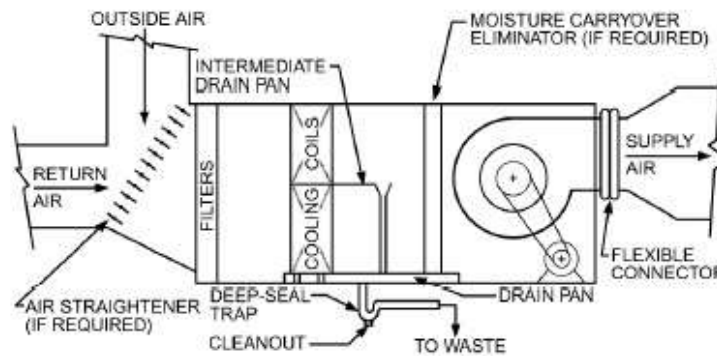


Fig. 4 Typical Arrangement of Cooling Coil Assembly in Built-Up or Packaged Central Station Air Handler

4.4 DX type Cooling Coil (Not applicable for fresh air unit)

DX Type cooling coils shall be of suitable diameter copper tubes and 20G or suitable thick with sine wave aluminium fins firmly bonded to copper tubes assembled in zinc coated steel frame with minimum 6-row deep. Cooling coil shall be AHRI approved. Each coil shall be factory tested air / N₂ pressure under water. Tube shall be hydraulically/mechanically expanded for minimum thermal contact resistance with fins. The cooling coil assembly shall be on aluminium rails and nylon rollers for easy withdrawal from either side. Distributor to be provided for DX coils.

4.5 Condensate Pan (Not applicable for fresh air unit)

Cooling coil condensate drain pan shall be dual/single sloped extended horizontal beyond the coil depth by 500 mm. Insulated Condensate drain pan shall be fabricated from minimum 18G stainless steel sheet (SS 304) with all corners welded with uniform slope from all sides leading to drain point ensuring no stagnation of condensate water. Drain point/pipe coming out from AHUs should be also of SS 304. It should be isolated from bottom floor panels through 25 mm heavy duty TF expanded polystyrene or polyurethane foam, nitrile rubber. Drain plug shall be provided in the bottom of the coil section.

4.6 Electrical Heater (As applicable)

Heaters shall be of electrically operated and controlled by Thyristor. Heater to be provided with flow switch it should not operate in no flow condition. The AHU vendor shall design and select the heater capacity to achieve the required discharge air condition. AHU vendor shall refer the P&ID / Data sheet to select

the proper capacity. Heaters shall be provided on sliding channels with access door for ease in serviceability.

- 4.7 Fresh Air , Supply air & Return Air Damper:** AHU with mixing box shall be complete with fresh and return air dampers. For MAU no mixing box is required. All dampers shall be low-leakage, opposed blade type. Blades shall be made of double skin aerofoil design extruded aluminium alloy frame. All linkages and supporting spindles shall be made of aluminium or nylon, turning in Teflon bushes. Manual dampers shall be provided with a Bakelite knob for locking the damper blades in position. Linkages shall be extended wherever required for motorized operation. Damper frames shall be sectionalized to minimize blade warping. Air leakage through dampers in the closed position shall not exceed 1.5% of the maximum design air volume flow rate at the maximum design air total pressure.

4.8 FILTERS

This specification covers the design manufacture, construction features, erection, testing & commissioning at site of Air Filters: Filter bypass shall be as per EN 1886.

- Pre filters (G4) (mandatory)

Pre-filter shall be capable of filtration of dust particles as per En-779/ASHRAE52.1 -1992 (with minimum 90% efficiency down to 10 μ m). The filter shall be made of non-woven synthetic media and shall be capable of being washed repeatedly for re-use. The media shall retain its shape, size and thickness even after repeated washing. The filter housing shall be made of aluminum frame. Differential Pressure gauge shall be considered across filters in addition to differential pressure switch.

- Fine Filters (F7) (If required)

Fine filter shall be flanged type having efficiency as per En-1822/ASHRAE52.1 -1992 (with minimum 99% efficiency down to 3 μ m). Filter media shall be imported synthetic medium supported by HDPE mesh and Al-mesh. Casing for filter shall be anodized Aluminum frame of 18G. The filters shall be fire resistant. They shall be capable of being replaced or removed for servicing without the use of special tools. Max. Initial and final pressure drop shall be 8 mm to 20 mm. Sealing medium shall be food grade epoxy. Differential Pressure gauge shall be considered across filters in addition to differential pressure switch.

HEPA Filter (H14) (For clean room only)

HEPA filter shall be flanged type having efficiency as per En-1822/ASHRAE52.1 -1992 (with minimum 99.97% efficiency down to 0.3 μ m). Filter media shall be imported synthetic medium supported by HDPE mesh and Al-mesh. Casing for filter shall be anodized SS frame of

18G. The filters shall be fire resistant. They shall be capable of being replaced or removed for servicing without the use of special tools. Max. Initial and final pressure drop shall be 10 mm to 20 mm. Sealing medium shall be food grade epoxy. Differential Pressure gauge shall be considered across filters in addition to differential pressure switch.

4.9 Motor Blower Assembly: Both fan and motor assemblies shall be mounted on aluminium alloy or galvanized steel of suitable common base frame. Isolation of fan from the unit casing shall be provided by spring and rubber anti vibration mounts; and flame retardant, waterproof neoprene impregnated flexible connection on the fan discharge. Motor blower assembly should be mounted with suitable spring type vibration isolator.

4.10 Glands: Suitable compression glands for cable entry and nozzles for pressure measurement/filter testing shall be provided with closure for unused nozzles.

4.11 Access Door: AHUs shall have adequate nos. of air tight, hinged, quick operating access doors, with nylon hinges and locks openable from both inside and outside in the fan and filter sections and in all other sections as required and/or as shown on the drawings. Access doors shall also be insulated, double skin type. The location & dimensions of access doors shall be suitable for the duty. Doors shall be provided on the accessible side of the AHU keeping in view the installation layout. Limit switch to be provided for each access door and upon opening of the door AHU fan to be shutdown.

4.12 Painting: Shop coats of paint that become marred during shipment or erection shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas; and then coated with paint to match the finish over the adjoining shop painted surface.

4.13 Safety features

Each Unit must have safety features as under:

- The fan access door shall be equipped with micro-switch (limit switch) inter locked with fan motor to enable switching off the fan motor automatically in the event of door opening.
- Fan and motor base shall be properly earthed from the factory.
- All screws used for panel fixing and projecting inside the unit shall be covered with PVC caps to avoid human injury.
- All sensors shall be intrinsically safe.
- Marine lamp to be provided for the visibility inside the air washer during maintenance.

- In case of belt driven fan belt guard to be provided.
- OSHA approved fan guard along with aluminum wire mesh for protection at access panel.
- View port on minimum 10" (250 mm) shall be provided on the fan door panel to monitor the fan and motor status

5.0 CONDENSING UNITS FOR AHU (OUTDOOR UNITS) (Not applicable for fresh air unit/ Chilled water based units)

The Condensing unit shall be factory assembled, weather proof casing, constructed from heavy gauge mild steel panels and coated with baked enamel finish. The unit should be completely factory wired tested with all necessary controls. Air-cooled condensing unit of suitable capacity with Scroll/Rotary inverter compressor of reputed make complete with copper piping, first charge of refrigerant gas, HP and LP cut-outs, microprocessor based control panel, temperature controller, Thermostatic expansion valves, suitable insulation of the suction line, suitable size of fan etc. Microprocessor controller should be loaded with features like auto switch on or off compressors, auto restart after power failure, runtime equalization of the compressor & time delay between compressor starts in case of multi compressor units, anti-recycle time delay to protect compressors from instant start/restart. The condensing units shall be mounted on suitable supporting MS structure.

- 5.1 Compressor:** Compressor shall be of the hermetically sealed scroll/rotary inverter type with Gas cooled motor, balance and mounted on vibration absorber to provide quiet, free floating operation. Compressor shall be protected against overload protection and single phasing protection. Refrigerant should be R410.
- 5.2 Control:** Unit shall be completely factory wired internally. Electrical characteristics of unit shall be 415+/-10% volts, 50 Hz, three phase AC. Compressor and fan motor shall be served by separated thermal and electrical over load protection. High-Low pressure-stat shall be provided to protect compressor against excessively high and too low pressure. Control thermostat shall be located in unit return air stream / room. Control circuit shall be such that compressor cannot restart without manual resetting when it trips due to any reason other than thermostat tripping. Compressor shall be interlocked with blower fan so that it cannot start unless fan is on. All necessary safety devices shall be provided to ensure safe operation of the system.
- 5.3 Condensing coil:** The Condensing coils shall be constructed out of copper tubes mechanically bonded to aluminum fins. Adequate surface area shall be offered.
- 5.4 Refrigerant Charge:** Initial charging of refrigerant & oil shall be supplied with the unit, within the same price till final commissioning and handing over system to IPR.

5.5 Painting: All the equipment including base frame shall be painted with two coats of the suitable paint of enamel colour over a rust resistant primer.

6.0 Controller for AHU System

A Microprocessor based Remote Control Unit/DDC shall be provided for AHU Air Conditioning system and suitable to control the entire air conditioning system and set working parameters (temperature & RH control, reheaters, fan control, filter monitoring, heater control, Fire interlocks, Flow control, condenser unit interlocks etc.) of AHU. AHU having less number of I/O PID controller to be provided. Controller Unit shall be completely factory wired internally and mounted in the AHU Room. Microprocessor control should be loaded with features like display unit, auto switch on/off Fan, heater, compressors, auto restart on power restore, switch off the condensing units when AHU get off/ tripped due to any reason, step less control of re-heaters by Humidistat. A Microprocessor based Remote Control Unit shall be provided for AHU Air Conditioning system, suitable to be mounted near the entrance door of the premises. It should be possible to operate the entire air conditioning system and set working parameters of each AHUS unit from this control unit. It should be able to communicate with central BMS system.

The Microprocessor based Remote Controller shall be able to control each AHUs & ODUs set with the following functions:

- Modulation of control valve or expansion valve as per temperature sensor feedback
 - On/Off heater based on RH sensor feedback
 - Remote on/off fans and monitoring
 - Filter chock condition monitoring with DPS
 - Single point returns air temperature setting of in case of multi compressor units/condensing units.
 - Indication of operation condition of each system.
 - Controlling of expansion valve of condensing unit based of temperature sensor feed back.
 - On/off unit as per fire panel feedback and fire damper feedback.
 - AHU & condensing unit shutdown in the event of fire.
 - AHU shutdown in case of fire damper off condition
 - Limit switch operation monitoring
- a. Thermostat:** Thermostat shall be electronics type, as specified herein, with sensing element located in the AHU return duct. All thermostats shall be supplied with the standard mounting boxes, as recommended by the manufacturer. The profiles, mounting arrangement and exact location of the thermostats shall be as approved at site.

Requirement of thermostats shall be as in Schedule of Quantities. Control thermostat shall be located in unit return air stream / room.

- b. Calibration and Testing:** All automatic controls and instruments shall be factory calibrated and provided with necessary instructions for site calibration and testing. Various items of the same type shall be completely interchangeable and their accuracy shall be guaranteed by the manufacturer. All automatic controls and instruments shall be tested at site for accuracy and reliability before commissioning the installation.
- c. Internal wiring:** All wiring shall be carried out with 1100 Volts grade single core multi strand flexible copper conductor wires with PVC insulation and shall be vermin and rodent proof. The current carrying capacity of wire shall be adequate for the duty assigned to it and shall have sufficient flexibility to facilitate proper termination at any location. Panel wiring shall be securely supported, neatly installed by lacing and tying, readily accessible and connected to equipment terminals and terminal blocks. Wire terminations shall be made with solder less crimping type of tinned copper lugs, which firmly grip the conductor and insulation. Insulated sleeves shall be provided at all the wire terminations. Engraved core identification plastic ferrules marked to correspond with panel wiring diagram shall be fitted at both ends of each wire. Ferrules shall fit tightly on the wires and shall not fall off when the wire is disconnected. Tag name and ferrule nos. shall be approved by IPR.

7.0 ELECTRICAL

Electrical panel shall include voltage & current meters, Relay, MCB, Contactor, Fuses, indication lamps, circuit breaker, starter, necessary switches, timers, single phasing preventers, feeders, Incomers and internal wiring.

Panel unit shall be installed at a convenient location as directed by the Engineer In-Charge/Architect/Interior Designer to facilitate operation. All cabling/wiring shall be done with fire retardant cables only. Power supply shall be provided to panel. All power/control cabling/wiring & earthing between the panel and equipment to be done by contractor without any extra charge.

Any cables/wires that are concealed (e.g. in shafts or above false ceiling), or are encased in wall chases, must be installed in conduits to facilitate replacement in case of any fault in future.

The panel shall be fabricated from high quality 14 gauge sheet, stiffened and suitably reinforced. The steel sheet shall be painted with seven tank processes & the final paint coat shall be stove enameled. The housing shall be of sectionalized construction with space provided for separate vertical bus droppers & cable alley of minimum 200 mm

width for each panel section. The overall construction of the panel shall be dust & vermin proof.

Minimum size of power wiring shall be 2.5 mm² copper. Control wiring shall be done with 1.5 mm² stranded copper conductor, PVC insulated wires.

Circuit breakers and large isolating switches shall be positioned as far as possible below the bus-bar chamber to allow for ease of cabling. All equipment such as meters and indicating lights shall be located adjacent or on the unit with which these are connected to achieve a neat and symmetrical arrangement. Facility shall be provided for termination of all normal types of cables entering from above and clamps shall be provided to support the weight of cables. Name plates to indicate the equipment of circuit controlled by the switches shall be fixed on the panels. Local push button to be provided for AHU and MCB to be provided for ODU.

8.0 MANDATORY SPARES

SCHEDULE OF MANDATORY SPARES			
The Bidder shall Include the price for the mandatory spares			
Sr. No.	Equipment tag no.	Description of spare	Remarks
1	AIR HANDLING UNITS	ONE (1) SET VEE BELTS	
	(FOR EACH MODEL /	TWO (2) SETS OF BLOWER BEARINGS	
	SIZE)	TWO (2) SETS OF BLOWER MOTOR BEARINGS	
		FILTERS ONE SET FOR ONE AHU OF EACH	
		MODEL / SIZE	
		ONE (1) MOTOR FOR EACH SIZE OF AHU	
		ONE (1) COUPLING DIRECT DRIVEN FAN	
		SEALS AND GASKET 10% OF TOTAL/ AT LEAST	

		ONE	
2	CABLES AND ACCESSORIES	TERMINATION KIT FOR EACH SIZE OF CABLES LUGS 10% OF TOTAL WITH ATLEAST ONE OF EACH SIZE WHICHEVER IS HIGHER	
3	PANEL ACCESSORIES	10% OF TOTAL WITH ATLEAST ONE OF EACH SIZE WHICHEVER IS HIGHER	
4	INSTRUMENTS	MIN 1 NO OR 10 % OF TOTAL QUANTITY WHICHEVER IS HIGHER, FOR EACH TYPE OF INSTRUMENT	
5	LOCAL PANEL MOUNTED HARDWARE	MIN 1 NO OR 10 % OF TOTAL QUANTITY (WHICHEVER IS HIGHER), FOR EACH TYPE OF HARDWARE.	
6	ANNUNCIATION SYSTEM	1 NO OF EACH TYPE OF I / O	
7	I & C CABLES	10 % OF TOTAL QUANTITY OF EACH TYPE	

9.0 TESTING AND INSPECTION

- Manufacturers shall demonstrate Run Test at their works (Air quantity v/s static pressure and Leak Test) of AHU (To be decided by purchaser / consultant)
- Vendor shall test all wiring in presence of Client lead engineer.
- Vendor to test continuity of all wires. Vendor shall also test all devices to insure proper operation. All motors shall be bumped and the wire meggered.
- The following test parameters shall be compliance by supplier & need to be carried out at site in presence of Client representative:
 - Air in DB and WB temperature
 - Air out DB and WB temperature.
 - Air flow quantity at inlet
 - Air flow quantity at outlet
 - Air temperature at inlet of coil

- Air temperature at outlet of coil
- Fan air outlet velocity
- Fan static pressure
- Fan power consumption
- Fan speed
- Leak testing of AHU casing as per SMACNA Class 6 standards/ EN1886

10.0 SPECIFIC INSTRUCTIONS TO BIDDERS

- The BIDDER shall furnish all the information called for in various schedules failing which the bid will be considered incomplete & the purchaser reserves the right to reject the bid.
- The BIDDER shall carefully study all sections of this specification and indicate all deviations in the Schedule of Deviations. If deviation sheets are not submitted in the Schedule of Deviations sheets, it will be presumed that the offer conforms in all respects to the specification and the purchaser reserves the right to reject the same. Bids as such without any further reference to the BIDDER. If the BIDDER indicates any comments on specification elsewhere in the Bid, the same will not be accepted as the basis for extra claims for conformity with the specification after award of the Contract. No deviations post bid will be entertained.
- The scope of equipment to be supplied under this contract is detailed hereinafter.
- The BIDDER shall prepare and submit three copies of the system "Operation, Maintenance and installation Manual" within the time schedule specified for the contract and before handing over the system for operation.
- BIDDER shall indicate necessary start-up spares required during erection, testing and commissioning and included in the quoted price.
- The BIDDER shall furnish make, type, and model number etc. of all bought-out components/items along with his Bid as per approved vendor list. All other vendors shall be subject to the Tata power's approval.
- After award of contract BIDDER shall furnish detailed layout drawings, and cross sectional drawing of each equipment indicating material of construction, applicable code/standard etc. for purchaser's approval. VENDOR shall take care of all comments indicated in the drawing by purchaser. These comments will be based on specification, relevant code/standard, statutory regulations good engineering practice, layout requirement, ease in maintenance etc. for which no extra claim shall be applicable after placement of order.

- BIDDER shall furnish detailed bar chart for the scope of services within a week after the date of issue of Letter of Intent/P.O.

11.0 SUBMISSIONS BY BIDDERS

- The vendor shall submit the following information with his proposal. The proposal will not be considered complete until all information has been submitted.
- Filled datasheet of AHU and condensing unit
- General Arrangement Drawings for equipment offered
- Dimensional drawings with each selection identified by model number and equipment numbers, suitable for use in equipment layout;
- Unit specification describing construction and indicating material gauge or thickness;
- List and description with manufacturer's name of all major components and instruments;
- Fan data and fan curves indicating the operating point of each selection;
- Coil data & Selection;
 - Face velocity
 - Air pressure drop across ahu
 - Pressure drop and velocity thru coil
 - Flow requirement in cfm
 - Entering and leaving air temperatures
 - Entering and leaving water temperatures
- Filter data;
- Operating equipment weight and size;
- Electrical power requirements;
- Layout of AC plant indoor and outdoor units.
- Detailed description of the equipment and brochures with regard to technical details.
- Electrical motor datasheet
- Electrical panel GA, wiring diagram and datasheet.
- Control panel GA, wiring diagram & datasheet.
- Various submittals as called for in the specification.

- Spare part list
- Operation and maintenance manual

12.0 PERFORMANCE PARAMETER

- Air flow rate & static pressure as per BOQ
- Cooling, heating, humidification capacity as per BOQ
- Noise level as per specification
- Electrical power consumption
- AHU leakage and heat transfer rate as per specification

13.0 PERFORMANCE GUARANTEE

- Performance guarantees for the Air Handling Unit shall be as specified in BOQ/tender specifications.
- The equipment shall be designed for continuous operation to satisfy the performance as specified in the specification.
- Instruments required for performance testing at shop as well as site shall be supplied by Vendor. These may be taken back by the Vendor after the conclusion of the test. The class of accuracy of the instruments shall be as specified in the code. The detail procedure of test shall be jointly agreed upon prior to commencement between Purchaser & Vendor.
- If any requirement in the system required for performance test of AHU, vendor has to furnish same detail to client to include the same in system. If Vendor has not provide such detail in advance and later on during performance if vendor ask requirement then same is provide on cost of the vendor.
- The guaranteed performance figures (with tolerances as per standards) of the equipment shall be proved by Vendor during tests. Should the results of these tests show any deficiency from the guaranteed value, Vendor shall modify the equipment as required at no extra cost.
- Till the successful completion of performance/ acceptance test, Purchaser shall not be responsible for providing any supervisory or skilled manpower or operators.
- The noise level at 1 meter from the equipment shall not exceed 75dBA. Vendor also has to confirm the noise level when three chiller in running condition.

- No tolerance shall be permitted on quoted guaranteed figures, except measurement tolerances as per applicable codes. Necessary correction factors in final form for variation of parameters shall be furnished before the performance guarantee test.
- If Vendor fails to achieve the guarantee set forth above, Vendor shall investigate the causes and undertake to rectify and replace, free of cost to Purchaser, the defects of the plant within a period mentioned in the terms of contract and prove the guarantee.
- Equipment shall be guaranteed for the specified duty, for repair/replacement, free of cost to Purchaser of any defect, fault or deficiency in vendors design, engineering, material, workmanship, construction/fabrication and manufacture.
- The guarantee shall cover free replacement by Vendor to the satisfaction of Purchaser of any malfunctioning component due to defective material, wrong selection or faulty fabrication within the period of guarantee.
- Liquidated damage charges towards power/utility consumption shall be as per PO terms.

14.0 DATASHEET

- Refer Excel sheet.

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	STANDARD SPECIFICATION FOR SPLIT/DUCTABLE AC	

STANDARD TECHNICAL SPECIFICATION
FOR
SPLIT/ DUCTABLE AC

Contents

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- 2. codes & standards**
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- 9. Mandatory Spare**
- 10. Datasheet**

1.0 SCOPE

- 1.1 This specification covers the general design, materials, construction features, manufacture, shop inspection and testing at manufacturer's works, delivery at site, handling at site, installation, testing, commissioning, performance testing and handing over of ductable split air-conditioners.
- 1.2 Real time based sequential panel, timer control with auto change over between units shall be provided for all the AC plants so that one by one machine will come in operation for set time duration. In case of failure of one machine, next machine will come in operation. In case of additional load, additional AC machine next in the sequence will also come in operation.
- 1.3 The requirements laid down in this specification are the minimum requirements. Nothing herein shall be construed to relieve the CONTRACTOR of their responsibility for ensuring the equipment's full integrity and performance.
- 1.4 Commissioning spares shall be in the scope of supply of Vendor till successful commissioning of plant with product.
- 1.5 The vendor must guarantee that spare parts for the selected equipment model remain available for a long-term duration.

2.0 CODES AND STANDARDS

The design, materials, construction, manufacture, inspection, testing and performance of ductable split air-conditioners shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility. In particular, the ductable split air-conditioners shall conform to the latest editions of following standards:

ASHRAE 15/34	Safety Code for Mechanical Refrigeration
ASHRAE 37	Methods of Testing for Rating Unitary Air-Conditioning and Heat Pump Equipment
ASHRAE 23	Methods of Testing for Rating Positive Displacement Refrigerant Compressors and Condensing Units
ASTM	American Society for Testing and Materials
ASME Section VIII Division I	(Unfired Pressure Vessels)

ANSI B31.5	Refrigeration piping (Current Edition)
IS 2501	Solid drawn copper piping for general engineering
IS 1391	Standard for Unitary Air conditioning system
IS 8148	Packaged air conditioners – specification
ISO 16358	Air cooled air conditioners and air to air heat pump testing and method of seasonal performance
AHRI 550/590	Performance rating of water chilling and water heating package using vapor compression cycle
AHRI 410	Performance rating of forced circulation air cooling and air heating coils

3.0 CONSTRUCTIONAL FEATURES

The unit shall consist of an outdoor unit (air-cooled condensing unit), an indoor unit (evaporating unit), an electronic control unit, Interconnecting refrigerant piping, controller and remote. Hi-wall split AC rating shall be of Inverter 3 star as minimum. Unit to be selected for 24 hr operation and spare parts should be easily available.

3.1 Out Door Unit:

- The outdoor unit shall house compressor, air cooled condenser with fan, expansion valve, refrigeration controls like Hi-Low pressure cut outs, etc.
- Cabinet shall be fabricated out of heavy gauge galvanized sheet steel properly formed for close fit and structural rigidity. All access panels shall be so constructed as to be quickly and easily removable. All sheet metal surfaces shall be finished in baked enamel paint or powder coating.
- Air-cooled condenser coil shall be made from copper tubes and aluminum fins bonded to the tubes. Condenser fans shall be propeller type. The entire air-cooled condensing unit shall have sheet metal housing suitable for outdoor installations. Speed of axial fans shall not exceed 960 RPM for fans with impeller diameter above 450 mm and 1440

RPM for fans with impeller diameter 450 mm and less. The impeller shall be statically and dynamically balanced.

- Compressor shall be inverter type and the hermetic scroll/ reciprocating type with suction and discharge valves, gas cooled motor, vertical crank-shaft balanced and mounted on vibration absorbers to provide quiet, free-floating operation. Compressor shall be provided with overload protection and single phasing protection.
- Scroll Compressor shall be hermetically sealed type. Motor shall be suitable for single phase 230 V + 10%, AC, 50 Hz or three phase 415V power supply, with built-in overload protection, mounted on vibration isolator rubber mounts.
- ODU to be supplied with supporting MS stand with powder coating or galvanized.
- Local MCB to be provided for ODUs.

3.2 Indoor Unit:

- Hi-wall: The Indoor unit shall house the cooling coil, air filter, evaporator fan with motor and air filter, installed in an aesthetically appealing plastic molded body made out of ABS or other engineering plastic material. The fan motor shall be designed for low noise, maximum speed being limited to 900 RPM. Noise level of the unit at highest speed shall not exceed 30dBA at 1 mtr. Unit shall be suitable for mounting on wall. Indoor unit fan speed shall be controllable with 3 to 4 stage of speeds. Split AC to be provided with cordless remote controller.
- Ductable unit: The unit shall be of heavy gauge steel, corrosion resistant, finished with synthetic enamel paint and thermally and acoustically insulated with resin bonded fiberglass or equivalent material. Unit shall be with hi flow hi static type. Fan shall be centrifugal type all other accessories fan, fan-motor, Air filter, an electronic expansion valve which can communicate with the controller in the condensing unit and suspension bracket on the body to be provided. Supports to be provided with spring isolators. The unit shall be suitable for ceiling suspension. Trap doors to be provided for ductable unit installed above false ceiling. Bidder to provide size of trapdoor. Ductable units to be provided with drain pump. Indoor unit fan speed shall be controllable with 3 to 4 stage of speeds. Ductable unit to be provided with corded remote controller. Noise level should be 50 dBA or below at 1 mtr. Unit should be acoustically & thermally insulated.
- Cassette unit : The unit shall be of heavy gauge steel, corrosion resistant, finished with synthetic enamel paint and thermally and acoustically insulated with resin bonded fiberglass or equivalent material. Unit shall be 4 way. Each unit shall be selected as the

requirement of the cooling load and interior layout in the respective space to be air-conditioned. The unit shall be equipped with automatic drain-pump, fan, fan-motor, Air Filter, an electronic expansion valve which can communicate with the controller in the condensing unit, and all related accessories. The fan shall of the dual suction multi blade type and statically and dynamically balanced to ensure low noise and vibration free operation. Unit to be provided with cordless remote. Unit size should be suitable for false ceiling grid size for ease of installation. Noise level should be 30 dBA or below at 1 mtr.

3.3 Electronic Control Unit:

- An electronic control unit covering the functions of temperature control, ON-OFF for fan & compressor and speed control of evaporator fan shall be provided along with the indoor unit. The control unit shall be either fixed to the indoor unit or pendant type with extension wire from the indoor unit or cordless. Power supply to control unit to be derived from AC unit supply only.

3.4 Interconnecting Refrigerant Piping & Wiring:

- The refrigeration piping shall be complete with externally equalized, thermostatic expansion valve, liquid line strainer, dehydrator with replaceable drying agent and liquid line shut-off valve.
- The piping shall be designed for an internal pressure representing the most severe condition of coincident pressure and temperature expected in normal operation.
- The refrigerant piping interconnecting to indoor & outdoor units shall be of copper and shall be joined by brazed type joints. Suction line shall be insulated with 6mm or (as per manufacturer recommendation) thick sleeve made out of closed cell elastomeric nitrile rubber foam insulation of fire retardant 'O' class. Wiring interconnecting the indoor and outdoor unit shall be done with PVC insulated copper conductor flexible wires of appropriate rating.
- All piping shall be supported on hot-dip galvanized perforated cable trays, and covered by GI sheet channels from the top wherever required, to prevent any type of damage during/after execution. The GI covers and trays shall be fixed to MS angle supports by bolting, to facilitate removal of the trays for verification of pipe leaks. All supports/clamps shall be painted with red oxide primer followed by 2 coats of synthetic enamel finish paint.
- The piping and wiring shall be laid such that it does not spoil the aesthetics of the premises, and is safe, secure and approachable for repair/replacement.

Note: For Split/ ductable AC 3 mtr length standard piping for refrigerant suction and discharge line each with all power & control cable to be provided. Any additional piping requirement to be recommended by bidder during bidding stage.

Note: For Split/ ductable AC/cassette AC all standard wall mounting and ceiling suspension support/ anchor bolt to be considered and provided.

Note: For Split/ ductable AC/cassette AC refrigerant pipe size to be selected as per OEM recommendation.

3.5 Drain Piping:

- The drain piping shall be made out of rigid CPVC pipes of 6 Kg/cm² class in screwed construction. The piping shall be insulated with closed cell nitrile rubber foam sleeve of minimum 12 mm thickness tightly fitted on the outer surface of the pipe. All insulation joints shall be sealed by insulation tape.
- The drain pan shall be connected to rigid PVC pipe by braided PVC flexible pipe with appropriate adaptors. The flexible pipe and adapters shall also be insulated in the same way as the rigid pipe.
- Vendor has to consider proper support/tray for laying of pipes & also needs to consider conduit or concealing of pipes wherever required.

4.0 ELECTRICAL

- 4.1 A terminal box on starter panel suitable for connecting external 3 phase, 4 wire cable shall be provided.
- 4.2 The unit shall be provided with single phase preventers for all motors.
- 4.3 MCB to be provided for split AC near indoor unit
- 4.4 DBs to be provided for cassette AC/ ductable unit
- 4.5 Local MCB to be provided for all Outdoor units
- 4.6 All units shall be with inbuilt starter.
- 4.7 The starter panels for indoor and outdoor units shall be pre-wired at the factory and shall be complete with starters for all motors.
- 4.8 Wiring between starter panel and indoor / outdoor units shall be carried out by HVAC vendor .
- 4.9 Corded/cordless remote controller shall be provided. Remote controller shall have ON/OFF, temperature control, fan speed control options.

5.0 SPECIFIC INSTRUCTIONS TO BIDDERS

- 5.1 The BIDDER shall furnish all the information called for in various schedules failing which the bid will be considered incomplete & the purchaser reserves the right to reject the bid.
- 5.2 The BIDDER shall carefully study all sections of this specification and indicate all deviations in the Schedule of Deviations. If deviation sheets are not submitted in the Schedule of Deviations sheets, it will be presumed that the offer conforms in all respects to the specification and the purchaser reserves the right to reject the same. Bids as such without any further reference to the BIDDER. If the BIDDER indicates any comments on specification elsewhere in the Bid, the same will not be accepted as the basis for extra claims for conformity with the specification after award of the Contract. No deviations post bid will be entertained.
- 5.3 The scope of equipment to be supplied under this contract is detailed hereinafter.
- 5.4 The BIDDER shall prepare and submit three copies of the system "Operation, Maintenance and installation Manual" within the time schedule specified for the contract and before handing over the system for operation.
- 5.5 BIDDER shall indicate necessary start-up spares required during erection, testing and commissioning and included in the quoted price.
- 5.6 The BIDDER shall furnish make, type, and model number etc. of all bought-out components / items along with his Bid as per approved vendor list. All other vendors shall be subject to the owner's approval.
- 5.7 After award of contract BIDDER shall furnish detailed layout drawings, and cross sectional drawing of each equipment indicating material of construction, applicable code/standard etc. for purchaser's approval. VENDOR shall take care of all comments indicated in the drawing by purchaser. These comments will be based on specification, relevant code/standard, statutory regulations good engineering practice, layout requirement, ease in maintenance etc. for which no extra claim shall be applicable after placement of order.
- 5.8 BIDDER shall furnish detailed bar chart for the scope of services within a week after the date of issue of Letter of Intent/P.O.

6.0 SUBMISSIONS BY BIDDERS

- 6.1 Bidder shall submit the following Data sheets / information along with the Technical Bid.
 - 6.1.1 Dully filled in schedules.
 - 6.1.2 Filled datasheet
 - 6.1.3 General Arrangement Drawings for equipment offered

- 6.1.4 Layout of AC plant indoor and outdoor units
- 6.1.5 Detailed description of the equipment and brochures with regard to technical details
- 6.1.6 Various submittals as called for in the specification.
- 6.1.7 Operation and maintenance manual
- 6.1.8 Spare list

7.0 PERFORMANCE PARAMETER

- Cooling capacity at 40 Deg C ambient as per BOQ/drawings
- Noise level as per tender specification
- Electrical power consumption as per load list/datasheet

8.0 PERFORMANCE GUARANTEE

- 8.1 The equipment shall be designed for continuous operation to satisfy the performance as specified in the specification.
- 8.2 Instruments required for performance testing at shop as well as site shall be supplied by Vendor. These may be taken back by the Vendor after the conclusion of the test. The class of accuracy of the instruments shall be as specified in the code. The detail procedure of test shall be jointly agreed upon prior to commencement between Purchaser & Vendor.
- 8.3 The guaranteed performance figures (with tolerances as per standards) of the equipment shall be proved by Vendor during tests. Should the results of these tests show any deficiency from the guaranteed value, Vendor shall modify the equipment as required at no extra cost.
- 8.4 Till the successful completion of performance/ acceptance test, Purchaser shall not be responsible for providing any supervisory or skilled manpower or operators.
- 8.5 No tolerance shall be permitted on quoted guaranteed figures, except measurement tolerances as per applicable codes. Necessary correction factors in final form for variation of parameters shall be furnished before the performance guarantee test.
- 8.6 If Vendor fails to achieve the guarantee set forth above, Vendor shall investigate the causes and undertake to rectify and replace, free of cost to Purchaser, the defects of the plant within a period mentioned in the terms of contract and prove the guarantee.

- 8.7 Equipment shall be guaranteed for the specified duty, for repair/replacement, free of cost to Purchaser of any defect, fault or deficiency in vendors design, engineering, material, workmanship, construction/fabrication and manufacture
- 8.8 The guarantee shall cover free replacement by Vendor to the satisfaction of Purchaser of any malfunctioning component due to defective material, wrong selection or faulty fabrication within the period of guarantee.
- 8.9 Liquidated damage charges towards power/utility consumption shall be as per PO terms.

9.0 MANDATORY SPARE

SCHEDULE OF MANDATORY SPARES			
The Bidder shall Include the price for the mandatory spares			
Sr. No.	Equipment tag no.	Description of spare	Remarks
1	IDU FILTER (FOR EACH MODEL / SIZE)	1 SET FOR EACH MODEL	
2	CABLES AND ACCESSORIES	TERMINATION KIT FOR EACH SIZE OF CABLES LUGS 10% OF TOTAL WITH ATLEAST ONE OF EACH SIZE WHICHEVER IS HIGHER	
3	PANEL ACCESSORIES	10% OF TOTAL WITH ATLEAST ONE OF EACH SIZE WHICHEVER IS HIGHER	
4	INSTRUMENTS	MIN 1 NO OR 10 % OF TOTAL QUANTITY WHICHEVER IS HIGHER, FOR EACH TYPE OF INSTRUMENT	
5	LOCAL PANEL MOUNTED HARDWARE	MIN 1 NO OR 10 % OF TOTAL QUANTITY (WHICHEVER IS HIGHER), FOR EACH TYPE OF HARDWARE.	
6	ANNUNCIATION SYSTEM	1 NO OF EACH TYPE OF I / O	

7	I & C CABLES	10 % OF TOTAL QUANTITY OF EACH TYPE	
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10.0 **DATASHEET**

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	STANDARD SPECIFICATION FOR VENTILATION FANS	

STANDARD TECHNICAL SPECIFICATION
FOR
VENTILATION FANS

Contents

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- 2. Codes & Standards**
- 3. Axial Fans - Constructional features**
- 4. Centrifugal Fans - Constructional features**
- 5. Inline Fans - Constructional features**
- 6. Propeller Fans – Construction features**
- 7. Louvers**
- 8. Filters**
- 9. Specific instructions to bidders**
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1.0 SCOPE

- 1.1. This specification covers the general design, materials, construction features, manufacture, shop inspection and testing at manufacturer's works, delivery at site, handling at site, installation, testing, commissioning, performance testing and handing over of ventilation fans.
- 1.2. The requirements laid down in this specification are the minimum requirements. Nothing herein shall be construed to relieve the CONTRACTOR of their responsibility for ensuring the equipment's full integrity and performance.
- 1.3. Commissioning spares shall be in the scope of supply of Vendor till successful commissioning of plant with product.
- 1.4. The vendor must guarantee that spare parts for the selected equipment model remain available for a long-term duration.

2.0 CODES AND STANDARDS

- 2.1 The design, materials, construction, manufacture, inspection, testing and performance of ventilation fans shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility. In particular, the fans shall conform to the latest editions of following standards:

IS 3588	Specification for Axial flow fans
IS 2312	Specification for Propeller type ac Ventilation fans
IS 4894	Specification for centrifugal fans
IS 9844	Methods of testing corrosion resistance of electroplated and anodized aluminium coatings by neutral salt spray test
IS 1730 purpose	Steel plate, sheet, Strips & flats for general and structural engineering
IS 277	Specification of plain and corrugated galvanized steel sheet.
IS 17570	Air filters for general ventilation

AMCA	Air movement control association
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ISO 12759	Efficiency classification for fans

3.0 AXIAL FANS - CONSTRUCTIONAL FEATURES

- 3.1 Impeller: The impeller shall have blades of an airfoil design. Blades shall be mounted on streamlined hub. Impellers with fabricated blades are acceptable up to 450 mm impeller diameter. The impeller shall be statically and dynamically balanced. Adjustable pitch blades shall be provided if specified in data sheet. Single piece cast aluminium or steel impeller shall be with blades of aerofoil design to give maximum efficiency and shall vary in twist and width from hub to tip to effect equal air distribution along the blade length. Maximum clearance between blade tip and the fan housing at the specified speed shall be 5 mm. Impellers blades shall be whirl tested to a speed 25% above the design operating speed. Extended grease leads for external lubrication shall be provided. The fan blade shall be adjustable type so that actual air flow can be achieved at site as per indicated in Drawings & BOQ. Fan velocity shall not exceed 2200 FPM.
- 3.2 Casing: The fans shall have a cylindrical casing constructed in mild steel or galvanized steel mount on a horizontal square base. Tall nuts & bolts associated with it shall be of zinc or cadmium plated. Casing shall be provided with suitable supports. Access door shall be provided in the casing for easy access to motor and impeller. Suitable arrangement for mounting of motors shall be provided. Casing shall be constructed of 14 gauge sheet steel, properly reinforced for rigidity. Fan casing, motor mount and straightening vanes shall be of welded steel construction motor mounting plate shall be minimum 20 mm thick and machined to receive motor flanges. Casing shall be provided with two nos. wide, hinged doors which open easily. Inspection doors with handle and neoprene gasket shall be provided. Casing shall have flanged connection on both ends for ducted applications. Support brackets for ceiling suspensions shall be welded to casing for connection to hanger bolts. Straightening vanes shall be aerodynamically designed for maximum efficiency by converting velocity pressure to static pressure potential and minimizing turbulence. Casing shall be bondorized, primed and finish coated with enamel paint.
- 3.3 Drive & Motor: Drive motor shall be rated at least 15 % higher than the power requirement at duty point or 10 % higher than the maximum power requirement at

selected speed, whichever is higher. Starting torque requirements of fan shall also be considered while selecting the motor.

Motor shall be squirrel cage, totally enclosed, fan cooled, and constant speed and motor nameplate horsepower shall be more than brake horse power by a minimum of 10%. Motor speed shall not exceed 1450 R.P.M (4 pole). The fan and motor combination selected for particular requirement shall be of the most efficient type so that sound level and energy consumption is minimum. Motor conduit box shall be mounted on exterior of the casing. Wires from the motor to the conduit box shall be protected from the air stream by enclosing in a flexible metal conduit. The motor shall have „E“ class insulation. For duct/wall/suspended fans, the impeller shall be mounted directly on the motor. Drive unit and impeller shall be totally enclosed inside the duct. For Floor/Ceiling Mounted Fan, the fan shall be provided with belt drive and adjustable motor sheave, standard sheet steel belt guard with vented front for heat dissipation. Belt shall be of the oil resistant type.

- 3.4** Noise and Vibration: Noise level produced by any rotating equipment individually or collectively shall not exceed 75 dB (A) measured at a distance of 1 meters from the source in any direction. The overall vibration level shall be as per zones A and B of ISO 10816-1. Balance quality requirement shall be G 6.3 conforming to ISO 1940/1.

Base shall be provided for each fan. Base for both fan and motor shall be built as an integral part and shall be mounted on a concrete foundation through spring type of vibration isolators. The concrete foundations shall be at least 15 cm above the finished floor level and shall be further isolated from the structural floor through 5 cm. Thick layers of sand all around, topped with bitumen. In case ceiling hung fan Vibration Isolation Suspension (VIS) shall be provided in each of string.

4.0 CENTRIFUGAL FANS - CONSTRUCTIONAL FEATURES

- 4.1** Scroll: Casing shall be welded construction fabricated with 14 gauge M.S. Sheet with spray galvanization. Minimum zinc deposition shall conform to class 375 of relevant latest IS code. The minimum thickness of casing shall not be less than 3 mm. The fan scroll shall be attached to the side plate by means of continuous lock seam. 18 gauge galvanized wire mesh inlet screens of 50 mm sieves shall be provided on both inlets. Housing shall be provided with standard clean out and door with quick locking tension handles and neoprene gasket. Rotation arrow shall be clearly marked on the housing.
- 4.2** Impeller: The impeller shall have die-formed, forward/backward curved blades, welded to the rim and back plates to have a non-over loading characteristic of the fan. Rim shall be spun to have a smooth contour if required, intermediate stiffening rings shall be provided. Shaft sleeves shall be furnished wherever required. The impeller, pulley and housing shall be statically and dynamically balanced. Fan velocity shall not exceed 2200 FPM.

- 4.3** Shaft: Shaft shall be constructed of SAE 1040 steel turned, ground and polished. Shaft sizes shall be carefully calculated and designed such that the maximum operating speed (RPM) shall not exceed 75% of the first critical speed.
- 4.4** Bearing: The bearing shall be self-aligning, heavy duty ball, roller or sleeve bearings. Bearing shall be selected for quiet operation and shall be grease pack, pillow block type. Bearings shall be maintenance free with permanently lubricated sealed ball bearing type. Inlet guard shall be spun to have a smooth contour. Inlet screen if provided shall be of galvanized wire mesh of 25 mm square.
- 4.5** Base Plate: Base plate shall be provided for each fan. Base for both fans and motor shall be built as an integral part and shall be mounted on a concrete foundation through cushy foot mountings for vibration isolation. The concrete foundation shall be at least 150 mm above the finished floor level and shall be further isolated from structural floor through 50 mm thick layers of sand all around, topped with bitumen.
- 4.6** Drive & Motor: Fan motor shall be of squirrel cage type totally enclosed fan cooled motor, suitable for $415 \pm 10\%$ volts, 50 Hz, 3 phase. Horse power indicated on the name plate of motor shall be more than brake horse power by at least 10% and shall have sufficient torque available for starting and continuous operation. Motor R.P.M. shall not exceed 1450 R.P.M. The fan motor combination selected for the particular requirement shall be of the most efficient type (i.e. smallest horse power) so that power consumption and noise level may be minimized. The motor shall have „F“ class insulation and four pole.
- These fan shall be provided with V-belts. All belt shall be selected for 150% rated HP. All V-belt shall be supplied with removable belt guards that do not impede the air flow to the fan inlet. There shall be a minimum of two belts per drive. Fan with motor shall be mounted on a concrete foundation through spring type of spring isolators vibration.

5.0 INLINE FANS - CONSTRUCTIONAL FEATURES

-line fans shall be Centrifugal type direct/belt driven complete with motor, belt guard, motor mount and vibration isolation type suspension arrangement mounted within/end of duct.

- 5.1** Casing: Shall be constructed of 14 gauge sheet steel enclosed cabinet. Wheel shall be Centrifugal fan DIDW forward curved blade and it shall be statically and dynamically balanced as per AMCA standard 1204-05. Fan casing, motor mount and straightening vane shall be of welded steel construction. Motor mounting plate shall be minimum 20 mm. thick and machined to receive motor flange. Casing shall be provided with two Nos. wide hinged doors which open easily. Inspection doors with handle and

neoprene gasket shall also be provided. Casing shall have flanged connections on both ends for ducted applications. Support brackets for ceilings suspensions shall be welded to the casing for connection to hanger bolts. Straightening vanes shall be aerodynamically designed for maximum efficiency by converting velocity pressure to static pressure potential and minimizing turbulence. Casing shall be bonderized, primed and finish coated with enamel paint.

Rotor: Hub and blades shall be cast aluminum construction. Blades shall be die formed Aerofoil section for maximum efficiency and shall vary in twist and width from hub to tip to effect equal air distribution along the blade length. Fan blades mounting on the hub shall be statically and dynamically balanced. Maximum clearance between blade tip and fan housing at the specified duty blade setting shall be 5 mm. Rotor blades shall be whirl tested to speed of 25% above the design operating speed and certification of the test shall be provided by the manufacturer. Extended grease leads for external lubrication shall be provided. Rotor shall be statically and dynamically balanced. The fan pitch control shall be manually readjusted at site upon installation for obtaining actual air flow values as specified and quoted. The impeller blade shall be of adjustable type blade.

- 5.2** Drive & Motor: Shall be squirrel cage, totally enclosed, fan cooled standard round frame, constant speed, continuous duty, single winding, suitable for 415/220 +/- 10% volts, 50 cycles, 3/1 phase power supply, provided with class "B" insulation. Motor nameplate horsepower shall be more than brake horsepower by a minimum of 10%. Motors shall be specially designed for quiet operation and motor speed shall not exceed 1500 RPM. For maximum efficiency or minimum horsepower. Motor conduit box shall be mounted on exterior of a casing, and lead wires from the motor to the conduit box shall be protected from the air stream by enclosing in a flexible metal conduit. The fan shall be provided with direct/belt drive within housing. The assembly of fan and motor shall be suspended from the ceiling by spring type vibration isolators.

6.0 PROPELLER FANS

- 6.1 The exhaust fans shall be propeller type with steel hub and blades, mounted directly on the shaft of a totally enclosed motor.
- 6.2 The fan blades shall be of pressed steel of aerofoil design for high efficiency and static pressure.
- 6.3 The mounting frame shall be of cast /sheet steel brackets to connect the frame, with the fan/motor assembly. Rubber mounts shall be provided between the mounting frame and the mounting brackets.
- 6.4 The fan motor shall be totally enclosed squirrel cage type.

6.5 All wall mounted exhaust fans shall be provided with gravity back draft louvers.

Note : Similarly, for hazardous areas in the project fan shall be spark proof and motor shall be flame proof.

7.0 LOUVERS, COWL PIECE, INSECT SCREEN

7.1 The louvers shall consist of parallel metallic blades. The louvers shall be provided with fixed type blades.

7.2 The width and angle of blades shall be such as to minimize the entry of water and snow inside. The minimum percentage of free area shall be 35% to 37%. The minimum projected width of blades in horizontal plane shall be 150 mm with the blades inclined at minimum 35 degrees. The blades shall be overlapping each other with maximum 30 mm height in vertical plane between two blades. Blades shall be bent back at edges and ridged to provide stiffness and prevent water from travelling up. Width of one bank of louvers shall be 1000 mm maximum. In case width is more, mullions shall be provided to restrict width to less than 1000 mm.

7.3 The louvers shall be located in such a manner that cross contamination from other exhaust does not occur.

7.4 The frame of fresh air louver shall have suitable frame work for installation of filter and damper.

7.5 The frame shall be painted with anti-corrosive and fire retardant material

7.6 The frame of louver shall have a sill extension of 50 mm to provide drip ledge so that rain water drains outside.

7.7 SS304 Bird/Insect screen of 10 mm² and minimum 16 G wire mesh shall be provided at inlet & outlet of axial fan. And at inlet of other fans.

7.8 SS304 Bird/Insect screen of 10 mm² and minimum 16 G wire mesh shall be provided at intake and exhaust air louver.

7.9 Rain protection cowls shall be designed to prevent water ingress during rain. The rain protection cowl shall be 45° turn down.

8.0 FILTERS

8.1 Pre-Filter: Pre-filter will contain washable synthetic fiber or High Density Polyethylene (HDPE) media having 18G Galvanised Steel Sheet (GSS) frame. The

filter media will be supported with HDPE mesh on one side and aluminium on the other side. Filter frame will be provided with suitable handles. The gravimetric efficiency of the pre-filter as per IS 7613 with test dust G3 will be 90% down to particle size of 20 microns.

9.0 SPECIFIC INSTRUCTIONS TO BIDDERS

- 9.1 The BIDDER shall furnish all the information called for in various schedules failing which the bid will be considered incomplete & the purchaser reserves the right to reject the bid.
- 9.2 The BIDDER shall carefully study all sections of this specification and indicate all deviations in the Schedule of Deviations. If deviation sheets are not submitted in the Schedule of Deviations sheets, it will be presumed that the offer conforms in all respects to the specification and the purchaser reserves the right to reject the same. Bids as such without any further reference to the BIDDER. If the BIDDER indicates any comments on specification elsewhere in the Bid, the same will not be accepted as the basis for extra claims for conformity with the specification after award of the Contract.
- 9.3 The scope of equipment to be supplied under this contract is detailed hereinafter.
- 9.4 The BIDDER shall prepare and submit three copies of the system "Operation, Maintenance and installation Manual" within the time schedule specified for the contract and before handing over the system for operation.
- 9.5 BIDDER shall include necessary start-up spares required during erection, testing and commissioning and to be quoted in offer.
- 9.6 The BIDDER shall furnish make, type, model number etc. of all bought-out components/items along with his Bid and shall be subject to the owners approval.
- 9.7 After award of contract BIDDER shall furnish detailed layout drawings, and cross sectional drawing of each equipment indicating material of construction, applicable code/standard etc. for purchaser's approval. VENDOR shall take care of all comments indicated in the drawing by purchaser. These comments will be based on specification, relevant code/standard, statutory regulations good engineering practice, layout requirement, ease in maintenance etc. for which no extra claim shall be applicable after placement of order.
- 9.8 BIDDER shall furnish detailed bar chart for the scope of services within a week after the date of issue of Letter of Intent/P.O.

10.0 SUBMISSIONS BY BIDDERS

Schedule of drawings and documents to be submitted for review, approval and information with submission dates

- 10.1 Filled Datasheet
- 10.2 Quality Assurance Plan (QAP)
- 10.3 General arrangement and section drawing with all dimensions and complete part list with codes and materials of construction.
- 10.4 Foundation drawing with pocket details with static and dynamic loads, unbalanced forces and moments, if any, for floor mounted fans.
- 10.5 Drawing showing details of wall openings and method of mounting fans for wall and duct mounted fans. These drawings shall also give static and dynamic loads, unbalanced forces and moments, if any.
- 10.6 Performance curves for fans with duty point marked
- 10.7 Torque- speed curve for fans
- 10.8 Motor datasheet
- 10.9 Spare part list
- 10.10 Erection, operation and maintenance manual

11.0 PERFORMANCE PARAMETER

- Air flow rate & static pressure as per BOQ/ drawings
- Noise level as per specification as per tender specification
- Electrical power consumption as per load list

12.0 PERFORMANCE GUARANTEE

- 12.1 The equipment shall be designed for continuous operation to satisfy the performance parameter as specified in the specification.
- 12.2 Instruments required for performance testing at shop as well as site shall be supplied by Vendor. These may be taken back by the Vendor after the conclusion of the test. The class of accuracy of the instruments shall be as specified in the code. The detail procedure of test shall be jointly agreed upon prior to commencement between Purchaser & Vendor.

- 12.3 If any requirement in the system required for performance test of chiller, vendor has to furnish same detail to client to include the same in system. If Vendor has not provide such detail in advance and later on during performance if vendor ask requirement then same is provide on cost of the vendor.
- 12.4 The guaranteed performance figures (with tolerances as per standards) of the equipment shall be proved by Vendor during tests. Should the results of these tests show any deficiency from the guaranteed value, Vendor shall modify the equipment as required at no extra cost.
- 12.5 Till the successful completion of performance/ acceptance test, Purchaser shall not be responsible for providing any supervisory or skilled manpower or operators.
- 12.6 The noise level at 1 meter from the equipment shall not exceed 75dBA. Vendor also has to confirm the noise level when three chiller in running condition.
- 12.7 No tolerance shall be permitted on quoted guaranteed figures, except measurement tolerances as per applicable codes. Necessary correction factors in final form for variation of parameters shall be furnished before the performance guarantee test.
- 12.8 If Vendor fails to achieve the guarantee set forth above, Vendor shall investigate the causes and undertake to rectify and replace, free of cost to Purchaser, the defects of the plant within a period mentioned in the terms of contract and prove the guarantee.
- 12.9 Equipment shall be guaranteed for the specified duty, for repair/replacement, free of cost to Purchaser of any defect, fault or deficiency in vendors design, engineering, material, workmanship, construction/fabrication and manufacture.
- 12.10 The guarantee shall cover free replacement by Vendor to the satisfaction of Purchaser of any malfunctioning component due to defective material, wrong selection or faulty fabrication within the period of guarantee.
- 12.11 Liquidated damage charges towards power/utility consumption shall be as per PO terms.

13.0 MANDATORY SPARE

SCHEDULE OF MANDATORY SPARES			
The Bidder shall Include the price for the mandatory spares			
Sr. No.	Equipment tag no.	Description of spare	Remarks
1	FAN	ONE (1) SET BELTS (BELT DRIVE FAN)	

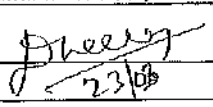
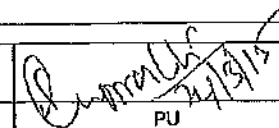
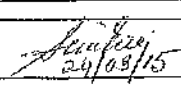
	(FOR EACH MODEL / SIZE)	TWO (2) SETS OF BLOWER BEARINGS	
		TWO (2) SETS OF BLOWER MOTOR BEARINGS	
		FILTERS ONE SET FOR EACH FANS (IF APPLICABLE)	
		ONE (1) COUPLING DIRECT DRIVEN FAN	
		SEALS AND GASKET 10% OF TOTAL/ AT LEAST ONE	
2	CABLES AND ACCESSORIES	TERMINATION KIT FOR EACH SIZE OF CABLES	
		LUGS 10% OF TOTAL WITH ATLEAST ONE OF	
		EACH SIZE WHICHEVER IS HIGHER	
3	PANEL ACCESSORIES	10% OF TOTAL WITH ATLEAST ONE OF	
		EACH SIZE WHICHEVER IS HIGHER	
4	INSTRUMENTS	MIN 1 NO OR 10 % OF TOTAL QUANTITY	
		WHICHEVER IS HIGHER, FOR EACH TYPE OF	
		INSTRUMENT	
5	LOCAL PANEL MOUNTED HARDWARE	MIN 1 NO OR 10 % OF TOTAL QUANTITY	
		(WHICHEVER IS HIGHER), FOR EACH TYPE OF	
		HARDWARE.	
6	ANNUNCIATION SYSTEM	1 NO OF EACH TYPE OF I / O	
7	I & C CABLES	10 % OF TOTAL QUANTITY OF EACH TYPE	

14.0 DATASHEET

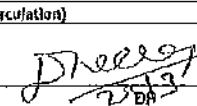
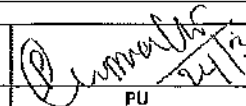
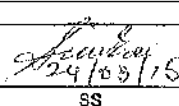
Document No. ENGG/ MECH/STD- SPEC/1804/22 Rev: R0 Date: 19/04/2022	HVAC system	Page 65 of 65
	Mandale 110kV GIS Building	

Annexure VII**QAPs**

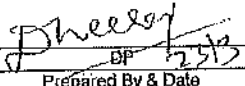
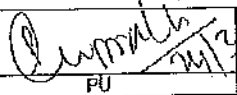
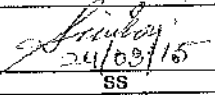
TATA POWER		The Tata Power Company Limited Corporate Engineering-Quality Assurance Inspection & Testing			
TPQA/IT-QA/XX-00-MX-SQP- 91		STANDARD QUALITY PLAN FOR SUPPLY & EXHAUST AXIAL FANS FOR HVAC		Date of Issue: 24.03.15	

Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	TYPE / METHOD OF CHECK	REMARKS
1	2	3	4	5
1.0	MATERIAL:	(Generally as per technical specification / approved datasheet)		
1.1	Tube Gasing	Chemical & Physical Properties	MTC Review	
1.2	Fan / Impeller	Chemical & Physical Properties	MTC Review	
2.0	INPROCESS INSPECTION: (Generally in-line with manufacturer standard)			
2.1	Impeller Balancing	Dynamic Balancing	Measurement	
3.0	FINAL INSPECTION & TESTS: (CUSTOMER HOLD POINTS) For Fan with capacity 10000 M ³ /HR, No CHP for smaller size			
3.1	Check for completeness as per the Drawing & BOM	Major Dimension	Measurement & visual	
3.2	Performance Test	Air flow, Static Pressure, Fan Speed, Power Consumption	Measurement	
		Vibration Level	Measurement	
		Noise Level	Measurement	
4.0	Document review & issuance of IRN	Review of quality dossier (*) & Inspection report	Review	(*) along with Index
NOTE	A). STATUTORY REQUIREMENTS WILL BE COMPLIED BY THE CONTRACTOR.			
	B). ALL MATERIAL SHALL BE AS PER APPROVED DRAWINGS / DATA SHEET.			
	C). TATA POWER / ITS REP IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED, IF REQD, SAME SHALL BE TRANSFERRED BY TATA POWER / ITS REP ONLY.			
	D). FINAL INSPECTION OF THE MAJOR ACTIVITIES ARE WITNESSED BY CLIENT AND IT IS HOLD POINT (AT THE DISCRETION TATA POWER)			
	E). MANUFACTURER SHALL PREPARE AND SUBMIT COMPLETE MANUFACTURING QUALITY PLAN IN PRESCRIBED FORMAT OR THEIR REGULAR FORMAT INDICATING THEIR REGULAR PRACTICES, TAKING CARE OF MINIMUM REQUIREMENT AS INDICATED ABOVE.			
	F). INSPECTION OF SPARES SHALL BE MANUFACTURED & INSPECTED AS PER APPLICABLE CLAUSES OF THIS QUALITY PLAN. SPARES OFFERED FOR INSPECTION SHALL BE PREFERRED ALONG WITH MAIN ITEMS (IF ORDERD).			
	G). AS PER SPECIFICATION PROPER PAINTING & PACKING SHALL BE ENSURED BY VENDOR BEFORE SHIPMENT TO AVOID ANY TRANSIT DAMAGE.			
Meant for (Internal Circulation / External - Stakeholders Circulation)				
R0	First Issue	 23/03	 PU 24/03/15	 SS 24/03/15
Rev. No	Reason for Revision	Prepared By & Date	Checked By & Date	Approved By & Date

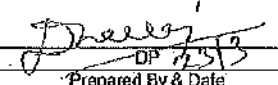
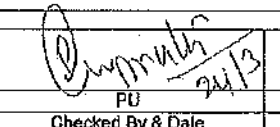
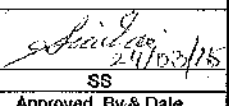
TATA POWER		The Tata Power Company Limited Corporate Engineering-Quality Assurance Inspection & Testing		 TATA
TPOAIT-QAXX-00-MX-SQP- 92		STANDARD QUALITY PLAN FOR WATER COOLED CHILLER		Date of Issue: 24.03.15

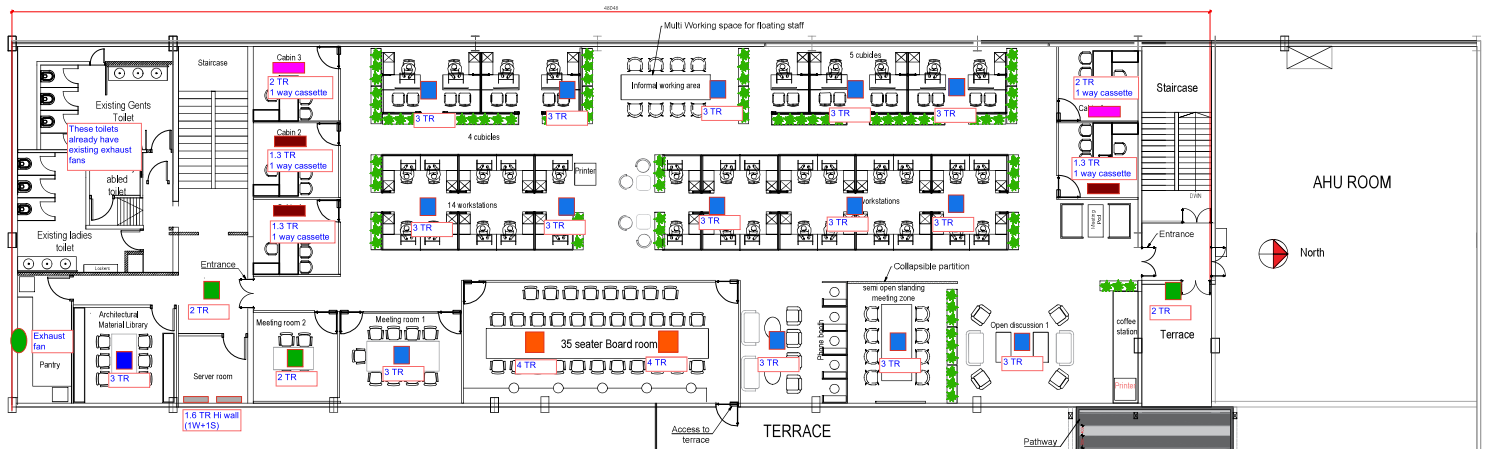
Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	TYPE / METHOD OF CHECK	REMARKS
1	2	3	4	5
1.0	MATERIAL:	(Generally as per technical specification / approved datasheet)		
	For Screw Chiller			
1.1	Copper Tube (Refrigerant Pipes Condenser & Chiller)	Chemical & Physical Properties	MTC Review	
		Eddy Current/ Pressure Testing	Measurement & visual	
1.2	Screw Compressors	Verification of Model No.	Visual & Verification of test report	
	For Condenser & Flooded Chiller			
1.3	Shell, Tubesheet (Condenser & Chiller)	Chemical & Physical Properties	MTC Review	
1.4	Rear Head & Front Head (Condenser & Chiller)	Chemical & Physical Properties	MTC Review	
2.0	INPROCESS INSPECTION: (Generally in-line with manufacturer standard)			
	For Screw Chiller			
2.1	Leak test of System (Soap / Leak Detector)	Pressure test	Measurement & visual	
	For Condenser & Flooded Chiller			
2.2	Welding & NDT on weld of Shell & Stub, Shell & Dish end (Chiller)	Weld Visual, DPT	Measurement & visual	
2.3	Tube to tube sheet Expansion	% of expansion (as per TEMA C)	Measurement & visual	
2.4	Pneumatic Test for Shell Side & Tube Side (Condenser & Chiller)	Leak tightness	Measurement & visual	
3.0	FINAL INSPECTION & TESTS: (CUSTOMER HOLD POINTS)			
3.1	Leak test of Refrigerant System for chiller (Electronic leak detection)	Leak test	Measurement & visual	
3.2	Complete unit performance test	Performance Parameters as per data sheet	Measurement & visual	One per type for CHP
3.3	Check for completeness as per the Drawing & BOM	Major Dimension	Measurement & visual	(*) along with index
4.0	Document review & Issuance of IRN	Review of quality dossier (*) & inspection report	Review	
NOTE	A). STATUTORY REQUIREMENTS WILL BE COMPLIED BY THE CONTRACTOR. B). ALL MATERIAL SHALL BE AS PER APPROVED DRAWINGS / DATA SHEET. C). TATA POWER / ITS REP IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED, IF REQD, SAME SHALL BE TRANSFERRED BY TATA POWER / ITS REP ONLY. D). FINAL INSPECTION OF THE MAJOR ACTIVITIES ARE WITNESSED BY CLIENT AND IT IS HOLD POINT (AT THE DISCRETION TATA POWER) E). MANUFACTURER SHALL PREPARE AND SUBMIT COMPLETE MANUFACTURING QUALITY PLAN IN PRESCRIBED FORMAT OR THEIR REGULAR FORMAT INDICATING THEIR REGULAR PRACTICES, TAKING CARE OF MINIMUM REQUIREMENT AS INDICATED ABOVE. F). INSPECTION OF SPARES SHALL BE MANUFACTURED & INSPECTED AS PER APPLICABLE CLAUSES OF THIS QUALITY PLAN, SPARES OFFERED FOR INSPECTION SHALL BE PREFERRED ALONG WITH MAIN ITEMS (IF ORDERED). G). AS PER SPECIFICATION PROPER PAINTING & PACKING SHALL BE ENSURED BY VENDOR BEFORE SHIPMENT TO AVOID ANY TRANSIT DAMAGE.			
Meant for (Internal Circulation / External - Stakeholders Circulation)				
				
RO	First Issue	PU	SS	
Rev. No	Reason for Revision	Prepared By & Date	Checked By & Date	Approved By & Date

TATA POWER		The Tata Power Company Limited Corporate Engineering-Quality Assurance Inspection & Testing		 TATA	
TPQAIT-QAXX-00-MX-SQP- 94		STANDARD QUALITY PLAN FOR AIR HANDLING UNIT FOR HVAC		Date of Issue: 24.03.15	

Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	TYPE / METHOD OF CHECK	REMARKS
1	2	3	4	5
1.0	MATERIAL:	(Generally as per technical specification / approved datasheet)		
1.1	Coils (Cooper & Aluminium tube)	Chemical & Physical Properties	MTC Review	
		Eddy Current/ Pressure Testing	Measurement & visual	
1.2	Skin Material (AHU Casing)	Chemical & Physical Properties	MTC Review	
1.3	Hollow Extrusion Section (Aluminium)	Chemical & Physical Properties	MTC Review	
1.4	Air Filters	Efficiency test report	Measurement & MTC Review	
1.5	Blower	Dynamic Balancing	Test Reports/ MTC Review	
1.6	Dampers	Major Dimension & movement	Measurement & MTC Review	
1.7	Air Washer Unit			Refer separate QAP
2.0	INPROCESS INSPECTION: (Generally In-line with manufacturer standard)			
3.0	FINAL INSPECTION & TESTS: (CUSTOMER HOLD POINTS)			
3.1	Check for completeness as per the Drawing & BOM	Major Dimension, Trial assembly/ match marking at shop	Measurement & visual	
3.2	Complete unit No load run test	Smooth Run, No undue noise & vibration	Measurement & visual	Performance parameters to be demonstrated at site
4.0	Document review & issuance of IRN	Review of quality dossier (*) & inspection report	Review	(*) along with index
N O T E	A). STATUTORY REQUIREMENTS WILL BE COMPLIED BY THE CONTRACTOR. B). ALL MATERIAL SHALL BE AS PER APPROVED DRAWINGS / DATA SHEET. C). TATA POWER / ITS REP IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED, IF REQD, SAME SHALL BE TRANSFERRED BY TATA POWER / ITS REP ONLY. D). FINAL INSPECTION OF THE MAJOR ACTIVITIES ARE WITNESSED BY CLIENT AND IT IS HOLD POINT (AT THE DISCRETION TATA POWER) E). MANUFACTURER SHALL PREPARE AND SUBMIT COMPLETE MANUFACTURING QUALITY PLAN IN PRESCRIBED FORMAT OR THEIR REGULAR FORMAT INDICATING THEIR REGULAR PRACTICES, TAKING CARE OF MINIMUM REQUIREMENT AS INDICATED ABOVE. F). INSPECTION OF SPARES SHALL BE MANUFACTURED & INSPECTED AS PER APPLICABLE CLAUSES OF THIS QUALITY PLAN. SPARES OFFERED FOR INSPECTION SHALL BE PREFERRED ALONG WITH MAIN ITEMS (IF ORDERD). G). AS PER SPECIFICATION PROPER PAINTING & PACKING SHALL BE ENSURED BY VENDOR BEFORE SHIPMENT TO AVOID ANY TRANSIT DAMAGE.			
Meant for (Internal Circulation / External - Stakeholders Circulation)				
RO	First Issue	 DP 24/3	 PU 24/3	 SS 24/03/15
Rev. No	Reason for Revision	Prepared By & Date	Checked By & Date	Approved By & Date

TATA POWER		The Tata Power Company Limited Corporate Engineering-Quality Assurance Inspection & Testing			
TPQAIT-QAXX-00-MX-SQP- 96		STANDARD QUALITY PLAN FOR AIR COOLED PACKAGE AC		Date of Issue: 24.03.15	

Sr. No	COMPONENT / OPERATION	CHARACTERISTICS CHECKED	TYPE / METHOD OF CHECK	REMARKS
1	2	3	4	5
1.0	MATERIAL:	(Generally as per technical specification / approved datasheet)		
1.1	Copper/Aluminium Tube (Condenser & Evaporator)	Chemical & Physical Properties	MTC Review	
		Eddy Current/ Pressure Testing	MTC Review	
1.2	Air Filters	Major Dimension, Efficiency test report	Measurement & MTC Review	
1.3	Scroll Compressors	Performance report & Model No., Type etc.	Verification of Routine test report / MTC	
1.4	Evaporator Blower & Condenser Fan	Dynamic Balancing & MOC	Test Reports/ MTC Review	
2.0	INPROCESS INSPECTION: (Generally in-line with manufacturer standard)			
2.1	Leak test of System (Soap / Leak Detector)	Pressure test	Measurement & visual	
3.0	FINAL INSPECTION & TESTS: (CUSTOMER HOLD POINTS)			
3.1	Leak test of Refrigerant System (Electronic leak detection)	Leak test	Measurement & visual	
3.2	Check for completeness as per the Drawing & BOM	Major Dimension	Measurement	
3.3	Complete unit run test	Performance parameters as per data sheet	Measurement & visual	If it is a single unit performance test to be conducted at vendor works
4.0	Document review & Issuance of IRN	Review of quality dossier (*) & Inspection report	Review	(*) along with Index
NOTE	A). STATUTORY REQUIREMENTS WILL BE COMPLIED BY THE CONTRACTOR.			
	B). ALL MATERIAL SHALL BE AS PER APPROVED DRAWINGS / DATA SHEET.			
	C). TATA POWER / ITS REP IDENTIFICATION STAMP ON MATERIALS WILL BE PRESERVED, IF REQD, SAME SHALL BE TRANSFERRED BY TATA POWER / ITS REP ONLY.			
	D). FINAL INSPECTION OF THE MAJOR ACTIVITIES ARE WITNESSED BY CLIENT AND IT IS HOLD POINT (AT THE DISCRETION TATA POWER)			
	E). MANUFACTURER SHALL PREPARE AND SUBMIT COMPLETE MANUFACTURING QUALITY PLAN IN PRESCRIBED FORMAT OR THEIR REGULAR FORMAT INDICATING THEIR REGULAR PRACTICES, TAKING CARE OF MINIMUM REQUIREMENT AS INDICATED ABOVE.			
	F). INSPECTION OF SPARES SHALL BE MANUFACTURED & INSPECTED AS PER APPLICABLE CLAUSES OF THIS QUALITY PLAN. SPARES OFFERED FOR INSPECTION SHALL BE PREFERRED ALONG WITH MAIN ITEMS (IF ORDERD).			
	G). AS PER SPECIFICATION PROPER PAINTING & PACKING SHALL BE ENSURED BY VENDOR BEFORE SHIPMENT TO AVOID ANY TRANSIT DAMAGE.			
Meant for (Internal Circulation / External - Stakeholders Circulation)				
R0	First Issue			
Rev. No	Reason for Revision	Prepared By & Date	Checked By & Date	Approved By & Date



INDOOR UNITS

	2 TR 4 way cassette	2TR dimensions: 950 x 950 x 260 mm 2TR weight: 25 kg Ceiling/slab suspended	
	3 TR 4 way cassette	3TR dimensions: 950 x 950 x 300 mm 3TR weight: 30 kg Ceiling/slab suspended	
	4 TR 4 way cassette	4TR dimensions: 950 x 950 300 mm 4TR weight: 30 kg Ceiling/slab suspended	
	2 TR 1 way cassette	2TR dimensions: 1400 x 600 x 150 mm 2TR weight: 23 kg Ceiling/slab suspended	
	1.3 TR 1 way cassette	1.3TR dimensions: 1400 x 600 x 150 mm 1.3TR weight: 23 kg Ceiling/slab suspended	
	1.6 TR Hi wall	1.6TR dimensions: 1000 x 300 x 300 mm 1.6TR weight: 15 kg Wall mounted	

OUTDOOR UNITS

36 HP VRF ODU
Dimensions: 3400 x 1400 x 900 mm
No of unit : 2 nos
weight: 600 kg
Floor mounted

12 HP VRF ODU
Dimensions: 1800 x 1200 x 900 mm
No of unit : 1 nos
weight: 220 kg
Floor mounted

These units will be mounted on terrace of second floor

6 TR / 1500 CFM TFA unit for fresh air
Dimensions: 1800 x 1200 x 1000 mm
No of unit : 1 nos
weight: 300 kg
Floor mounted



Special term and Condition

Supply, installation, testing and commissioning of complete VRF system capable of modulating capacity from 10%- 100%, with inverter based compressors, working on R-410A/R-407c/R-134a, special pre-coated fins (Hydrophilic Coating), microprocessor based PLC panel, corrosion resistant coated condenser, condenser fans, Indoor units, M.S. hot dip galvanised stands / supports, electrical, isolating valves; Power & Control Cabling/wiring, earthing between VRF & Indoor Units and all the necessary accessories and hardware for proper functioning of the units, having following Actual Output capacities.

The prices should include any lifting, shifting and positioning of outdoor units. The unit shall be factory charged & any top-up gas/oil required for first charge should be included in the individual price quoted below. This shall include the nitrogen leak testing, oil charging, vaccumisation .The outdoor unit shall be a factory assembled unit housed in a sturdy weather proof casing constructed from rust-proofed mild steel panels coated with powder coated finish.

The following safety devices shall be part of the outdoor unit:- High Pressure Switch, Low Pressure Switch, Fan Motor Safety Thermostat, Over Current Relay, Fusible Plugs, Fuses.

Notes :

1. All outdoor units should be designed at Ambient temperature 40°C.
2. Fins and copper tubes of Air Cooled Condenser alongwith copper tubing / piping with all joints and U-Bends exposed to corrosive atmosphere / aggressive ambient, shall be painted with special corrosion prevention coating. Complete System should be BMS/PLC compatible.
3. The VRF outdoor units should be selected for 3-phase power supply ($415 \pm 10\%$ & $50\text{Hz} \pm 5\%$)

Special Conditions

- 1) The above mentioned Quantities are tentative only, Bidder to add any item missing and which is necessary for smooth operation of VRF system.
- 2) Single point 3phase power feeder shall be provided to bidder for Outdoor unit Cabling from that feeder to all ODU shall be in bidder scope.
- 3) Single point single phase power feeder shall be provided to bidder for indoor units Cabling from that feeder to all Indoor shall be in bidder scope
- 4) Drain pipes to be laid till nearest drain.

Appendix 6: CSM F6 - Safety Competency Assessment Form (Template)

Name of the Vendor/Bidder:

Name of the Sub Vendor (If job is given to Sub Vendor):

Description of the Job:

Request for Quotation (RFQ) No.:

Vendor/Bidder to mandatorily provide the below safety competency related information:

1. Proposed Manpower Deployment Schedule : -

Type of manpower	Qualification	Experience	Month 1	Month 2	Month 3	
<u>Project /AMC Manager(R7)</u>						
Site In Charge						
Safety Manager						
Safety Officer						
Supervisors						
Technicians						
High Skilled workmen						
Skilled workmen						
Semiskilled workmen						
Lineman						
Helpers						
Drivers						
Unskilled						
<u>Others(R7)</u>						

Instruction to Bidders:

- i. Indicate the overall site manpower deployment schedule as above
- ii. Indicate direct or subcontracted employees by using color code given below:

Direct Bidder Employee – Green

Partly Direct / partly Subcontracted – Yellow

- 4.0.1 **Subcontracted – Red** *If subcontractor detail is not available at stage of Bid evaluation, then this can be agreed with Order manager or Engineer in charge before deployment Ensure that all sub-contractors follow the Tata Power Safety Procedure and agreed CSM F9 Site Safety Management Plan.R7*

- iii. Against each category, indicate minimum educational qualification and work experience
- iv. Add rows to include other specialized manpower, if any.

Ref No: CC27PMR014	TATA POWER COMPANY LIMITED	
Supply, Installation, Testing and Commissioning of VRF Air Conditioning System at Second Floor Office, Station A Building, Trombay Thermal Power Station, Chembur, Mumbai	SPECIAL CONDITIONS OF CONTRACT	Sheet 1 of 9

Sr. No.	TOPIC	PRINCIPLES OF TERMS & CONDITIONS
1	GENERAL	The Tata Power Company Limited (TPCL) invites sealed bid through Ariba online system for: SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF VRF AIR CONDITIONING SYSTEM AT SECOND FLOOR OFFICE, STATION A BUILDING, TROMBAY THERMAL POWER STATION, CHEMBUR, MUMBAI. The following Special Conditions of Contract (SCC) shall supplement the General Terms and Conditions – Supply and Services Wherever there is a conflict, the provisions herein shall prevail over those in the "General Terms and Conditions" (GTC) for Supply and Services.
2.	BRIEF SCOPE OF TENDER	Scope of work shall include design, manufacturing, supply, loading/unloading, installation, testing and commissioning of VRF AC system as per Technical specs/ Scope/ BOQ/ Layout/ Drawings attached in RFQ.
4.	CONTRACT PRICE AND CONTRACT STRUCTURE	The Bid Price shall remain valid for a period of 180 days, reckoned from the date of opening of the bids. Prices to be quoted strictly as per the attached Price Schedule. be a Lumpsum EPC fixed price contract in Indian Rupees for the specified quantum of work with rates firm & fixed till the tenancy of the Contract. The Contract Price shall include price for Design, Engineering, Supply of material Delivered at Place (DAP) Site basis, handlings, Installation, Testing and Commissioning and all taxes, levies and duties.
5.	TAXES AND DUTIES	All indirect taxes, duties, levies and cess in relation to the execution of this Contract, whether payable by Contractor or by Owner (in which case the same shall be paid by Contractor on behalf of Owner) shall be included by the Contractor in the Package Price. Only GST will be paid extra by the Owner as per the price schedule. Contractor shall take taxes, duties, levies and cess at the full tax rate as applicable and to note that there shall be no concessional duties of any kind to be considered for this Package. Owner shall not be responsible to provide any certificates/clearances for clearing/sale of goods at any concessional duties of whatsoever nature.
6.	EFFECTIVE DATE/CONTRACT PERIOD / DELIVERY SCHEDULE	The Effective Date of Contract shall be the date of issue of LOA / PO, whichever is earlier. All the works including design, manufacturing, supply, loading/unloading, installation, testing and commissioning, complete handover, submission of as built drawings, etc. of VRF AC system shall be completed within 90 days from Effective Date.

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7.	CONTRACT PERFORMANCE BANK GUARANTEE	Contractor shall submit within 15 days of Effective Date an unconditional irrevocable bank guarantee payable on demand duly stamped strictly as per the prescribed format of Owner for a sum equivalent to 10% of the Contract Price valid till the end of warranty period and with a claim period of not less than 6 months beyond the expiry date. An amount equivalent to CPBG shall be retained from Bidder's bills payable till such CPBG is submitted by Contractor. An amount equivalent to CPBG shall be retained from Contractor's bills payable till such CPBG is submitted by Contractor. Such amounts shall be released to the Contractor on submission of CPBG.
8.	TERMS OF PAYMENT	Payment terms for Supply shall be as under: 80% of Supply Price shall be payable on pro rata basis on receipt of equipment / material at Site for which Material Dispatch Clearance Certificate (MDCC) is issued by the Owner. The pro rata payment shall be made as per billing break-up agreed by Owner. 20% of Supply Price shall be payable on successful completion of installation, testing & commissioning at site, complete handover, submission of as built drawing, test documents / certificates, O & M Manual etc. as per tender specifications. 2) Payment terms for Services shall be as under: 100% of Services Price shall be payable on successful installation, testing & commissioning at site, complete handover, submission of as built drawing, test documents / certificates, O & M Manual, etc. as per tender specifications. All invoices for above milestones shall be payable within 60 days (45 days for MSME) of receipt of commercially clear and error free invoices along with enclosures/supporting for having completed the milestones and duly verified by the Engineer In-charge / Order Manager of the Owner for the same. All payments due to the Contractor shall be made only after deduction of the Liquidated Damages (LD) amount, TDS etc as applicable.
10.	LIQUIDATED DAMAGES FOR DELAYS, NON – PERFORMANCE & OVERALL CAP	The Liquidated Damages in case of delay & shortfall in Performance shall be as follows: LD for Delay for Supply and Installation: Completion Schedule shall be as defined in PO. For delays in overall completion beyond the Guaranteed Completion Schedule, as

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		specified in Tender Document, the Contractor shall pay the Owner/Project Manager by way of pre-determined Liquidated Damages for Delay at the rate of 1% of the PO value for every week or part thereof delay in achieving the Guaranteed Completion Dates subject to a maximum of 10% of the PO value. - Performance LD: Contractor must guarantee the desired performance parameters as per technical specification. If system does not meet the desired performance parameters after commissioning and testing owner has the right to reject the whole system or rectify it at Contractor's costs and recover the same from Contractor's payables / securities. - Performance LD shall for any shortfall in performance during AMC shall be as per the annexed Scope/SLA/terms for AMC attached to this SCC.
11.	WARRANTY / DEFECTS LIABILITY PERIOD	- Contractor should provide minimum of 2 years warranty on the whole system. - Contractor shall also undertake comprehensive AMC for a period of 5 years from the successful commissioning. The Scope & SLA for the AMC shall be as attached in SCC Annexure II. Comprehensive AMC for initial 2 years of warranty period shall be with nil cost. Price for Comprehensive AMC shall be quoted for 3rd year and 5% annual escalation will be given for next 2 years of CAMC. Bidder shall quote for the Comprehensive AMC price as per the Scope / SLA attached herewith.
13.	CONTRACTOR ALL RISK INSURANCE FOR SITE WORKS	Contractor shall take all necessary insurances of adequate sums (however not less than 110% of Contract Price) to cover all its manpower / material / resources including 3rd party general liability insurance / workmen compensation policy as applicable. In the event of any loss or damages or any accident etc., Contractor shall make all claims directly with his insurer. Any difference between the claims settled and the actual value of loss shall be borne by Contractor. Contractor will bear the additional costs for replacements if any and ensure timely delivery as mutually agreed. Owner shall not be responsible for any loss or damage whether by accident or otherwise to equipment or material or to any personnel of Contractor.

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14.	LODGING, BOARDING, TRAVEL AND LOCAL CONVEYANCES:	Prices shall be inclusive of boarding & lodging, travel costs, local conveyances of any nature and no separate payment on any of these accounts admissible. Contractor shall arrange for accommodation of his personnel outside the plant premises only (accommodation inside the plant premises shall not be permitted).
15.	SAFETY T&CS:	Contractor shall comply with all Safety Terms and Conditions of Tata Power annexed to the tender document and revised time to time. All workers shall undergo TPSDI L1, L2 and L3 training as per Safety terms and condition as per Tata Power terms and condition and cost towards this training shall be included in the quoted prices.
16.	ACCEPTANCE ON PF & ESI & OTHER STATUTORY COMPLIANCES:	Bidder shall have the PF & ESI registration and will comply with all statutory requirements and submit documentary evidence towards the same. This will include monthly wages register, PF & ESI challans for demonstrating compliance for minimum wages, PF & ESI for each individual employee in accordance with the wage register. The compliance statement with supporting challans will be submitted every month as per the timelines prescribed by Owner. PF, ESI & other statutory compliance of the previous month must be attached with the Invoice of any given month for release of service payments. The Bidder shall comply to the requirements stated under Vendor Declaration Compliances Form (V12) attached as Volume F7 pertaining to guidelines of the Central Electricity Authority and provide the undertaking as per the form prescribed therein towards the statutory compliances / site operating procedures compliances. Bidder shall also provide medical report for all his employee at the time of joining without any cost to Owner.

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Annexure I

Name of Training Program	Applicable to	Training duration	Training Charges	Total Charges /per Person	Validity
SHE-L0 Basic Safety Training	Contractor workers engaged in non-technical works e.g. Housekeeping, Gardening, Pantry, Canteen, driving of passenger vehicle etc.	1 days	Rs 700.00 Per day /per person	Rs. 700/- Per person / per training	3 years
SHE-L1 Basic Safety Training	All contractor workers engaged in technical jobs	2 days	Rs 700.00 Per day /per person	Rs. 1400/- Per person / per training	3 years
SHE-L2 Critical Safety Procedure for relevant procedure	Contractor workers engaged in critical jobs (13 critical work are Work at Height, Work on electrical System, Work in confined space	2 Days	Rs 700.00 Per day /per person	Rs. 1400/- Per person / per training	3 years
SHE-L3 Training for supervisors	All Supervisors working under contractors	2 Days	Rs 700.00 Per day /per person	Rs. 1400/- Per person / per training	3 years
SHE L1/L0 Revalidation Test	All employees of Contractors	Quarterly Online test	Free	Free	3 months

ANNEXURE – II: SCOPE / DELIVERABLES FOR COMPREHENSIVE AMC FOR VRF AIR CONDITIONING SYSTEM AT SECOND FLOOR OFFICE, STATION A BUILDING, TROMBAY THERMAL POWER STATION, CHEMBUR, MUMBAI

1. LIST OF UNITS COVERED:

Comprehensive Annual Maintenance to be carried out for AC Systems to ensure machine is maintained in perfect working condition at all times at the location as per the RFQ
Bidder is advised to visit Site before submitting the Bid, to investigate and make a careful examination, survey and inspection of Site and to satisfy itself as to the feasibility of executing the Contract Works at the Site. By submitting the Bid, Bidder acknowledges and confirms that he

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has made a careful examination, survey and inspection of the Pre-Effective Date Conditions and has satisfied itself as to the feasibility of executing the contracted Works at the Site.

2. SCOPE OF WORK / SERVICES UNDER AMC:

- a) All equipment under contract needs to be serviced for preventive maintenance once every quarter during the contract period as per standard checklists.
- b) In addition, all breakdown calls need to be attended and resolved.
- c) Cost of all required spare parts/ consumables/ tools & tackle/ boarding & lodging/ out of pocket expenses of any kind for performing the Scope of Work/ Services as enumerated below shall be borne by Contractor (subject only to exclusions limited to those listed in Clause 5 below).
- d) All the replaced spares shall be of original equipment manufacturer. Whenever equipment is taken out for repairs / replacement of spares, all the non-replaced parts of equipment shall be same as original on return and original working parts are not tampered. It shall be the responsibility of Contractor to ensure that the machine is duly inspected and recorded with User for any missing/non-OE parts before taking the machine outside the Site for repairs failing which Contractor shall be responsible for any missing/non-OE parts.
- e) Contractor has to maintain a maintenance register during each visit mentioning what kind of job/inspection has been done during that visit. Contractor also has to provide maintenance/inspection report after each visit and inspection.
- f) It is recommended that the Contractor shall depute a single person who have full knowledge of these systems and can control all these maintenance works, so that authority can contact him for any kinds of problems of the all system.
- g) Cost of spare parts/consumables required shall be borne as per type of contract and shall be applicable to all activities specified.
- h) The Scope of Work / Services under the AMC shall include but not limited to:
 - i. Complete checking of the AC System for general operation.
 - ii. Checking of compressor for proper functioning / output pressure and repair/overhaul including replacement of parts.
 - iii. Checking the indoor and outdoor fan motors, blowers, motors and their electrical controls on the respective equipment.
 - iv. Checking all safety / operational control functions such as pressure cut-outs/ temperature cut-outs/ cut-ins for proper functioning and in case of any mal-functioning, they should be either repaired or replaced accordingly as required.
 - v. Checking the refrigeration system for any leakages.
 - vi. Greasing / Lubrication of oiling of motors and other moving parts.
 - vii. Inspection and cleaning of all air filters / HEPA filters, replacements if required.
 - viii. Check drain pan, drain line, coil fins and cooling & condenser coils for biological growth and clean as needed.

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- ix. Checking all switch operations, replacement of defective switches, electronic parts, PCBs, sensors, controllers etc.
- x. Inspect the control panel & PCBs of indoor and outdoor units for proper functioning.
- xi. Checking all electrical & control wirings for any cuts/defects/loose connections and attending the defects.
- xii. Check variable-frequency drive for proper functioning.
- xiii. Testing the cooling efficiency.
- xiv. Thorough cleaning / de-clogging of condenser and cooling coil, cleaning all sheet metal parts, any leakage in cooling coils to be repaired through brazing / welding
- xv. Refrigerant gas top-up / refilling as required.
- xvi. Carrying out - once in a year, external cleaning (chemical or with plain water) of condenser coils of outdoor unit.
- xvii. Tension adjustments of fan/motor/any other belts etc, replacements as needed.
- xviii. Repairs/overhauling/replacement of fans, compressors, all motors including replacement of parts as needed
- xix. Checking and repairs to refrigerant piping, insulation, drain pipes, ducts, etc. for any leakages/damages.
- xx. Replacement of inter connection duct, canvas material for package units
- xxi. Checking of all damper functions as required for package units.
- xxii. Contractor should submit list of spare parts required to carry out repairs and maintenance works well in advance and should be approved by authority.
- xxiii. Contractors should follow all safety norms and provide necessary safety equipment at their own cost.

3. SERVICE FREQUENCY PHILOSOPHY:

The contractor shall ensure service frequency as under:

a) **Inspection:** Shall be carried out on all units on monthly basis. Contractor shall maintain logbook / asset card/certificate at all locations with the concerned User Representative where the inspection details will have to be filled in without any slippage and duly endorsed by User Representative with remarks that the Unit is in full operating condition.

b) **Preventive Maintenance/Servicing:** Shall be carried out on all units shall be on quarterly basis as per the Scope of Services defined above. The Contractor shall develop a detailed machine-wise plan for such preventive maintenance in accordance with the concerned User Representative in such a fashion that the operation of our plants and machinery is not affected and work is evenly distributed over the quarter.

c) **Breakdown Maintenance:** Contractor shall prioritise and attend all break-down calls (unlimited) for failure of any machines as reported by concerned User Representative irrespective of preventive maintenance schedule and as per service levels mentioned below.

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4. SERVICE LEVEL AGREEMENT:

Contractor shall ensure following service levels:

- a) **Call Response/Call Attending:** In case of any breakdown calls (unlimited), Contractor shall respond and attend the Call within the same day for call logged before 12 PM and by next day for all calls logged after 12 PM on any given day.
- b) **Minor Repairs:** Minor repairs (e.g. repairs requiring minor spares which are routinely carried by technicians) shall be attended and resolved within maximum 1 working day of call log.
- c) **Major repairs:** All major repairs (e.g. repairs requiring specific spare parts not readily available with visiting technicians etc.) will be attended maximum within 4 working days of call log.
- d) **Off-site repairs:** For repairs requiring Unit/part of the Unit to be removed and taken to off-site service bench, Contractor shall arrange for a standby machine within 2 working day of call log before taking the machine out for repairs. In cases where standby is not feasible e.g. Package AC Units, Contractor shall ensure that such parts are repaired at workshop and machine put in operation not later than 7 days from the first call log.

5. EXCLUSIONS:

The following are excluded from the Scope of Work/Services above:

- a) Items extraneous to the basic machine, such as mains switch and cabling up to machine.
- b) Items that are beyond repair due to loss of metal or due to corrosion or rust caused by ageing or breakages not attributable to Contractor. Such items shall be limited to the following: Condenser coil, Evaporator coil, Compressor bottom, sheet metal body, breakable plastic parts like knobs, front grill etc.
- c) Masonry work, carpentry work, structural modification connected with the above.
- d) Electrical cabling, electrical switch boards and electrical accessories connected with main incomer to the Unit
- e) Insulation, false ceiling work and painting thereof.

6. LIQUIDATED DAMAGES FOR DEFAULT IN SERVICE LEVEL AGREEMENT:

- a) In case any quarterly preventive maintenance visit is not carried, the pro-rata payment for that quarter shall not be made plus 10% of the quarter's AMC shall be deducted from bills payable / next AMC invoice.
- b) In case any quarterly preventive maintenance visit is delayed beyond a fortnight of the scheduled preventive maintenance date, LD @5% shall be recovered from the AMC charge for that quarter.
- c) In case of default in attending breakdown calls, LD @1% for every day per event shall be recovered from that quarter's AMC. For multiple defaults (more than 3) during the same quarter, the entire AMC for that quarter shall stand forfeited.

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d) Notwithstanding above, in case of default in above agreed Service Levels, Owner shall have the right to get the machine/s covered under AMC repaired by a third party and recover all such costs related to repairs of the machine/s from the AMC amount payable for that quarter/subsequent quarter. In case of repeated failures in delivering the agreed Service Levels, Owner reserves the right to summarily terminate the contract without a notice period and forfeit the security bank guarantee / advance bank guarantees.

7. PAYMENT TERMS:

- a) 100% of the Payments shall be made at the end of every quarter against successful completion of relevant scope of the works and certification by Owner/Project Manager.
- b) All invoices shall be payable within 60 days (45 days for MSME) of receipt of commercially clear and error free invoices along with enclosures/supporting for having completed the milestones and duly verified by the Project Manager of the Owner for the same. All payments due to the Contractor shall be made only after deduction of the Liquidated Damages (LD) amount, TDS etc as applicable.

Price schedule - Supply, Installation, Testing and Commissioning of VRF Air Conditioning System at Second Floor Office, Station A Building, Trombay Thermal Power Station, Chembur, Mumbai (Tender Ref. No.: CC27PMR014)				
A	Supply, Installation, Testing and Commissioning (SITC) of Supply of VRF AC system			
Sr. No.	Description	Qty	Unit	Total Amount (INR)
I	Design, Engineering, Manufacturing, Supply of VRF AC system	1	Lumpsum	
		GST@ __%		
		Sub-Total incl. GST (I)		
II	Installation, Testing, Commissioning of VRF AC system	1	Lumpsum	
		GST@ __%		
		Sub-Total incl. GST (II)		
III	Mandatory Spares	1	SET	
		GST@ __%		
		Sub-Total incl. GST (III)		
		Total (I+II+III)		
		Total incl. GST (I+II+III)		
B	Comprehensive AMC after warranty period of 2 years			
Sr. No.	Description	Qty	Unit	Total Amount (INR)
1	CAMC for 3rd year	1	Lumpsum	
	(CAMC for initial 2 years warranty period shall be with nil cost. Price for CAMC shall be quoted for 3rd year as above and 5% annual escalation will be given for next 2 years of CAMC)	GST@ __%		
		Total incl. GST		

Special Notes:-

1. Bidder shall submit price strictly as per the above price schedule.
2. GST will be paid extra (if applicable) by the Owner as per the price schedule. Bidder to indicate the rate of GST in the price schedule.

Date:
Place:

(Authorised Signatory with company seal)
Name:
Designation:
Bidder Name:

The Tata Power Company Limited is hereunder referred to as the “Purchaser” or “Company”. The person, firm or company selling the goods, the subject of this purchase order is referred to as “Vendor” or “Contractor”. The subject of this purchase order is hereinafter referred to as the “Material(s)” or “Goods”.

The Contract shall mean the contract as derived from the following:

1. Purchase Order (with ‘Commercial Notes’ and Annexures to the Purchase Order referred thereon)
2. Technical Specifications.
3. General Terms & Conditions

The documents including all reference document (s) and Annexures forming the Contract are to be read together as a whole and are to be taken as mutually explanatory.

1. Price:

Unless otherwise specifically stipulated, the price shall be firm and shall not be subject to escalation for any reason till the validity of this Contract.

Unless otherwise specifically stipulated, the price shall be inclusive of road/ rail worthy water-proof packing & forwarding charges up to effecting delivery at FOT/ FOR despatch point, GST and shall also be inclusive of inland freight, terminal taxes and entry taxes as leviable on the transportation or entry of goods into any local area limits pursuant to the Contract.

2. Taxes and Duties:

- 2.1 The Contract Price shall be inclusive of all taxes, duties, including but not limited to GST or any local taxes, levies imposed by State/Central/Local governments
- 2.2 Taxes as mentioned in the Contract Price or Price Schedule shall be paid to the contractor subject to the Contractor complying with all the statutory requirements and furnishing the relevant documents including error free invoices containing detailed break-up of the taxes
- 2.3 However the payment of GST or local levies shall be restricted to the total amount as indicated in the price schedule.
- 2.4 Any duties, levies or taxes not mentioned in Contract Price or Price Schedule but applicable as per any statute (s) shall be deemed to be

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included in the Contract price and shall be to the account of the Contractor.

- 2.5 Any statutory variation in duties, levies or taxes if applicable and specified in this Contract till the scheduled date for supply of Goods and limited to direct invoices of the Contractor shall be to the account of Purchaser. The Contractor shall have the obligation to provide the necessary documentary evidence / supporting by way of gazetted notifications etc. to prove the change in such levies or taxes between the due date of submission of the Bid and the scheduled date of supply of goods to claim the difference.
- 2.6 The Contractor shall pass on to the Purchaser all the benefits of either reduction in tax rates, exemptions, concessions, rebate, set off, credits etc. or introduction of new tax rates exemptions, concessions, rebate, set off, credits etc. pertaining to all taxes, duties, imposts, fees and levies in respect of the supplies of Goods or performance of obligations under the contract. This would specifically include reduction of tax rates as a result of statutory changes or judicial rulings.
- 2.7 Any other taxes, levies and duties not mentioned in Contract Price or Price Schedule but applicable as per any statute (s) or introduction (omission) of new taxes, levies and duties shall be deemed to be included in the Contract Price and shall be to the account of the Contractor.
- 2.8 For facilitating availment of a credit, set-off, rebate, drawback or like benefit available to the Purchaser, the Contractor will facilitate the Purchaser by providing the necessary documentary and/or procedural support. In any process of assessment or re-assessment, of taxes payable by the Purchaser. Wherever expressly agreed the purchaser would provide the statutory form ‘C’ to the seller for availing the concessional rate of Central sales tax.
- 2.9 The Contractor shall bear and pay all the costs, liabilities, levies, interest, penalties in respect of non-compliances of any legal requirements as per various statutory provisions. The contractor shall keep the owner indemnified at all times from any tax liability, interest, penalties or assessments that may be imposed by the statutory authorities for non-compliances or non-observation of any statutory requirements by the Contractor.
- 2.10 Purchaser shall pay the invoices to the Vendor after necessary deductions as prescribed under the applicable law, income – tax or other

deductions under the State Tax laws as may be applicable to the Contract.

3 Packing details:

Packing details: The material must be packed in suitable packing to suit the mode of transport and to ensure its safe receipt at point of delivery. Any damage to material noticed at the time of delivery at site, due to improper packing or any other reason whatsoever shall be the responsibility of the Vendor. Such damaged goods shall be replaced within 14 days from intimation from the Purchaser.

4 Transportation and Unloading at Site:

The Vendor shall deliver the Material(s) at site/ Stores as per the delivery address specified in the Purchase order. The unloading at delivery shall be organised by the Purchaser unless otherwise specified. The receipt of the material/ equipment is subject to inspection and rejection if Material(s) is found unsatisfactory or any of the clauses under this purchase order are violated.

5 Insurance:

Unless otherwise specified, Purchaser will be responsible to obtain transit insurance for the Material(s). The Vendor shall intimate the Order Manager (as mentioned in the Purchase Order) along with Invoice, packing list, the Railway Receipt/Truck or Lorry Receipt etc. immediately after the consignment is booked, at the e-mail id mentioned in the Purchase order.

6 Payment Terms:

100% payment shall be made within 60 days from the receipt and acceptance of the material at the Consignee Stores/ Site/ Location as per the Contractual terms and conditions herein.

7 Bills and invoice:

The tax invoices should contain the details to comply with the GST Law. The supplier shall:

- i) Furnish (electronically) and communicate to the Owner, the details of Goods or Services supplied by the 10th of the month succeeding the said tax period,
- ii) Upon discovery of any discrepancy, rectify it and shall pay the tax and interest thereof,
- iii) Furnish the returns (electronically), for the inward and outward supplies of

Goods and/or Services, before the specified dates as per the GST Law,
iv) Communicate the tax paid, credits etc. as and when credited.

v) The Invoice should clearly state the description of the goods, quantity, sale price, tax %, and tax amount;

vi) The Invoice should be signed by an Authorized Signatory.

Bills/Invoices in the name of The Tata Power Company Ltd. with packing lists in triplicate shall be forwarded along with the equipment.

Contractor to furnish GST Registration no. in all invoices as well as Purchaser's (Tata Power's) GST no.

8 Transfer of Title and risk:

The transfer of property and risk of Material(s) shall be deemed to take place as follows:

- a. For delivery F.O.R. or F.O.T. despatch point: Transfer of property on handing over the Material(s) to the carrier against receipt of clean Railway Receipt/Truck or Lorry Receipt and such receipt having been handed over to Purchaser. However, the risk of loss shall pass to the Purchaser on delivery of goods at the specified destination.
- b. In case the Material(s) are procured by the Vendor from sub-vendors on receipt of duly endorsed documents of title to the goods.

9 Contract Performance Bank Guarantee (In case applicable):

9.1 The Vendor shall within 15 days of issue of this Purchase Order furnish an unconditional irrevocable bank guarantee duly stamped and strictly as per the prescribed format of the Purchaser from any nationalized bank or any scheduled bank having a branch in Mumbai and approved by the Purchaser for a sum equivalent to 10% of the Total value of Order valid for a period not less than 6 months from the expiry of the Warranty period.

9.2 Irrespective of the performance demonstrated as part of the Factory Acceptance Tests Take-over tests / Performance Tests etc, the Purchaser may call for re-validation of performance of the system during the performance guarantee period by conducting fresh performance tests if in its opinion, the

system is not able to deliver the designed performances based on its operational performance results. If the equipment fails to prove the performance during such performance tests, the Purchaser may allow the Vendor to either rectify the system by addition / modification of equipment etc at the Vendor's costs & risk to restore the performance levels. Failure to rectify the system to achieve the designed performance levels may result in imposition of penalties including revocation of the Performance Bank Guarantee and forfeiture of the entire amount under the Performance Guarantee.

- 9.3 In case the Vendor fails to furnish the requisite Bank Guarantee as stipulated above, then the Company shall have the option to terminate the contract besides other contractual remedies.

10 Price reduction:

- 10.1 The Vendor agrees that time of supply of Material(s) is of prime importance. If the Vendor fails to supply Material(s) before the respective scheduled / fixed date for supply. Company may without prejudice to any other right or remedy available to the Company: -

- 10.1.1 Recover from the Vendor ascertained and agreed, genuine pre-estimate liquidated damages, and not by way of penalty, a sum equivalent to 1% (of total value of order) per week or part thereof for each week's delay, beyond the scheduled supply date each subject to maximum of 10% of the total order value, even though the Company may accept delay in supply after the expiry of the scheduled supply date. The Company may, at its discretion, set off the aforesaid amounts from any other amounts owed by the Company to the Vendor or recover such amounts in other manner as may be permissible under applicable laws.
- 10.1.2 Arrange to get supply from elsewhere on account and at the sole risk of the Vendor, such decision of the Company being final and binding on the Vendor; or
- 10.1.3 Terminate the contract or a portion of supply of the supply work thereof, and if so desired, arrange for the supply in default by the Vendor to be attained from elsewhere at the sole risks and costs of the Vendor.

- 10.2 Liquidated damages for performance shortfall (if applicable) shall be specified in the Technical Specifications.

- 10.3 The Liquidated Damages referred in this clause 10 may be recovered by the Company from the Vendor as set off against any monies owed by the Company to the Vendor or in any other manner permissible under applicable laws.

11 Warranties:

- 11.1 Materials and Workmanship: Vendor shall fully warrant that all the stores, equipment and component supplied under the order shall be new and of first class quality according to the specifications and shall be free from defects (even concealed fault, deficiency in design, materials and workmanship).
- 11.2 Should any defects be noticed in design, material and/or workmanship within 12 months after the Material(s) or any portion thereof as the case may be have been commissioned or for 24 months from the date of delivery, whichever period concludes earlier. Purchaser shall inform Vendor and Vendor shall immediately on receipt of such intimation, depute their personnel within 7 days to investigate the causes of defects and arrange rectification/ replacement/modification of the defective equipment at site, without any cost to Purchaser within a reasonable period. If the Vendor fails to take proper corrective action to repair/replace defects satisfactorily within a reasonable period, Purchaser shall be free to take such corrective action as may be deemed necessary at Vendor's risk and cost after giving notice to the Vendor, including arranging supply of the Goods from elsewhere at the sole risk and cost of the Vendor.
- 11.3 In case defects are of such nature that equipment shall have to be taken to Vendor's work for rectification etc., Vendor shall take the equipment at his costs after giving necessary undertaking or security as may be required by Purchaser. After repair Vendor shall deliver the equipment at site on freight paid basis. Any taxes applicable in relation to this repair shall be to the Vendor's account. All risks in transit to and fro shall be borne by the Vendor.
- 11.4 Equipment or spare parts thereof replaced shall have further warranty for a period of 12 months from the date of acceptance.

12 Quality, Testing, inspection, installation:

- 12.1 All Material(s) supplied under this Contract shall be new and unused.

- 12.2 Wherever a specific Quality Assurance Plan is provided with the Request for Quotation (RFQ) or agreed as part of the commercial/ technical discussions, the same shall be binding on the Vendor.
- 12.3 The material shall be inspected
- At consignee end by Purchaser.
 - At factory premise of the Vendor/ sub-vendor by Purchaser or third party duly nominated by Purchaser. The Vendor shall extend all necessary co-operation to Purchaser/ third party inspector carrying out the inspection. The Inspector(s) shall have the right to carry out the inspection or testing, which will include inspection and testing of the raw materials at manufacturers shop, at fabricators shop and at the time of actual despatch before and/or after completion of packing.
- 12.4 The Vendor will inform Purchaser at least eight (8) days in advance of the exact place, date and time of tendering the Material(s) for required inspection and provide free access to the Inspector(s) during normal working hours at Vendor's or his/ its sub-Suppliers works, and place at the disposal of the Inspector(s) all useful means for undertaking the Inspection, checking the results of tests performed, marking the Material(s), getting additional tests conducted and final stamping of the Material(s).
- 12.5 Even if the inspection and tests are fully carried out, the Vendor shall not be absolved from its responsibilities to ensure that the Material(s), raw materials, components and other inputs are supplied strictly to conform and comply with all the requirements of the Contract at all stages, whether during manufacture and fabrication, or at the time of Delivery as on arrival at site and after its erection or start up or consumption, and during the defect liability period. The inspections and tests are merely intended to prima facie satisfy Purchaser that the Material(s) and the parts and components comply with the requirements of the Contract.
- 12.6 *All costs associated with the inspection shall be included in cost of Material(s).*
- 12.7 Original material test certificate/ performance test certificate/ fitment certificate/ test reports etc. relevant/ applicable as per the

specifications/ standards shall be dispatched along with the material supply failing which the material may be rejected.

13 Rejection:

- 13.1 Rejected goods shall be removed and replaced within 14 days of the date of communication of rejection.
- 13.2 Claim in respect of breakage/shortages in any cases shall be referred on the Vendor within ninety (90) days from the date of receipt of Goods by the Purchaser which shall be replaced/made good by the Vendor at his own cost. All risk of loss or damage to the material shall be upon the Vendor till it is delivered to the purchaser/consignee.

14 General Indemnity:

The Vendor shall indemnify and keep the Purchaser indemnified from and against any and all claims, costs, liabilities (financial), litigations, compensations, judgments, expenses or damages (including attorney's fees and other related expenses) arising out of any breach or alleged breach of any of the conditions of this Contract, performance of the obligations hereunder, or any representation or misrepresentation made by the Vendor or any third party with regard to the subject of this Contract.

15 Indemnity against IPR:

The equipment, system, drawings, and other materials that shall be supplied against the order will become the Purchaser's property. Without limitation of any liability of whatsoever nature, the Purchaser shall be indemnified and kept indemnified against any claim for infringement or breach of any of the statutes, rules & regulations by the use of or sale of any article or material supplied by the Vendor. The indemnity shall include any infringement of patent, trade mark, design, copyright or other property rights whether in Country of Origin, or elsewhere resulting from the Vendor's design, manufacture, use, supply or re-supply & would also cover use or sale of any article or material supplied by the Vendor to the Purchaser under the Purchase Order. The Indemnity shall cover any claim/action taken by a third party either directly against the Purchaser or any claim/action made against the Vendor & where under the Purchaser is made liable. The

Indemnity shall be for losses, damages, and costs including litigation costs, attorney fees etc incurred by the Purchaser in relation to the Purchase Order.

16 Latent Defects Liability period (if applicable):

Notwithstanding the inspections, acceptance tests, quality checks etc carried out by the Vendor and witnessed/accepted by the Purchaser, the Vendor shall further warrant the equipment for any latent defects in its design, material or workmanship against the specifications set forth and shall make good any such defects by way of repair or replacement of the part or whole of the defective product at its own cost & risks as and when such latent defects are observed and intimated by the Purchaser and intimated to the Vendor within 36 months of completion of warranty period.

17 Force Majeure:

- 17.1 In the event of either party being rendered unable by force majeure to perform any obligation required to be performed by it under this Contract the relative obligation of the party affected by such force majeure shall, after notice under this articles be suspended for the period during which such cause lasts. The term 'Force Majeure' as employed herein shall mean acts of God, wars (declared or undeclared), riots or civil commotion, fire, floods, and acts and regulations of the Government of India or State Government or any of the statutory agencies. Both the party shall pay to the other party, the amount payable upon the date of the occurrence of such force majeure.
- 17.2 Upon the occurrence of such cause and upon its termination, the party alleging that it has been rendered unable as aforesaid, thereby shall notify the other party in writing immediately but not later than twenty four (24) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of the claims.
- 17.3 During the period, the obligations of the parties are suspended by force majeure, the contractor shall not be entitled to payment of any rate.
- 17.4 In the event of the force majeure conditions continuing or reasonably expected to continue for a period more than thirty (30) days, Purchaser shall have the option of terminating the contract by giving seven (7) days notice thereof to the contractor.

18 Variation:

Except for any provisions in this Purchase Order, any change /modification to the terms and conditions of this Order can be issued only by Purchaser or with the prior written approval from Purchaser.

19 Termination

- 19.1 The Contract shall be deemed to be terminated on completion of delivery of Material(s)
- 19.2 Termination of Default by Vendor:
Purchaser may terminate the contract at any time if the Vendor fails to carry out any of his obligations including timely delivery under this Contract. Prior to termination, the Vendor shall be advised in writing of the causes of unsatisfactory performance to be improved upon 15 days of the receipt of notice. In case, if the Vendor fails to bring about the improvement to the satisfaction of the Purchaser, then the order shall be terminated.
- 19.3 Without prejudice to the rights and remedies available to Purchaser, Purchaser may terminate the Contract or part thereof with immediate effect with written notice to the Vendor if,:
- 19.3.1 The Vendor becomes bankrupt or goes into liquidation.
- 19.3.2 The Vendor makes a general assignment for the benefit of creditors.
- 19.3.3 A receiver is appointed for any substantial property owned by the Vendor.
- 19.3.4 The Vendor has misrepresented to Purchaser, acting on which misrepresentation Purchaser has placed the Purchase Order on the Vendor.

The Vendor/ Contractor shall not be entitled to any further payment under the Contract if the Contract is terminated. If the order is terminated under clause 19.2 and 19.3, the Vendor shall not be entitled to any further payment, except that, if Purchaser completes the supply of Material(s) and the costs of completion are less than the Total Order value, the Purchaser shall pay Vendor an amount properly allocable to supply of Material(s) fully performed by Vendor prior to termination for which payment was not made to Vendor. In case, the cost of completion of Material(s) exceed the total Order value, the additional cost incurred by Purchaser for such completion shall be paid by the Vendor.

19.4 Purchaser shall be entitled to terminate the Contract at its convenience, at any time by giving thirty (30) Days prior notice to the Contractor. Such notice of termination shall specify that termination is for Companies convenience and the date upon which such termination becomes effective. Upon receipt of such notice, the Contractor shall proceed as follows:

- 19.4.1 cease all further work, except for such work as may be necessary and instructed by the Company/ Company's representative for the purpose of protecting those parts of the supplies already manufactured;
- 19.4.2 stop all further sub-contracting or purchasing activity, and terminate Sub-contracts;
- 19.4.3 handover all Documents, equipment, materials and spares relating to the supply of goods prepared by the Contractor or procured from other sources up to the date of termination for which the Contractor has received payment equivalent to the value thereof; and
- 19.4.4 handover those parts of the supplies manufactured by the Contractor up to the date of termination.

Upon termination pursuant to clause 19.4, the Vendor shall be entitled to be paid the full value on the Material(s) delivered in accordance with the Contract.

19.5 The Contractor shall not be released from any of his obligations or liabilities accrued under the Contract on termination. For the avoidance of doubt, the termination of the Contract in accordance with this clause shall neither relieve the Contractor of his accrued obligations for Warranty or his accrued liability to pay (liquidated) damages for Delay nor shall entitle him to reduce the value of Performance Security.

20 Sub letting and assignment:

The contractor shall not without prior consent in writing of the Purchaser, sublet, transfer or assign the contract or any part thereof or interest therein or benefit or advantage thereof in any manner whatsoever, provided nevertheless that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

21 Dispute Resolution:

Dispute or differences arising out or relating to this Order shall be resolved amicably by the parties. Failing such amicable resolution of dispute / differences either party may refer the matter to arbitration of a Sole Arbitrator to be appointed jointly by both the parties. The award of the Arbitrator shall be final, binding and conclusive on the parties. The venue for arbitration shall be Mumbai. The Arbitration proceedings will be governed and regulated by the provisions of Indian Arbitration and Conciliation Act, 1996 as amended from time to time and the rules framed there under.

22 Governing laws

This Contract shall be construed in accordance with and governed by the Laws of India without giving effect to any principle of conflict of law.

23 Jurisdiction

This Contract and the transaction contemplated herein shall be subject to the exclusive jurisdiction of the competent Courts in Mumbai only.

24 Limitation of Liability

Notwithstanding anything contained in the Contract, the Contractor's aggregate liability under this Contract shall be limited 100% of the Total order value. This shall however, exclude liability arising pursuant to clause 2.8- tax indemnity, clause 14- General Indemnity, clause 15- Indemnity against IPR, clause 25 – Confidentiality and liabilities arising due to wilful misconduct, gross negligence, third party claims and corrupt acts attributable to the Vendor.

25 Confidentiality:

The Vendor shall use the Confidential Information of the Purchaser only in furtherance of this Contract and shall not transfer or otherwise disclose the Confidential Information to any third party. The Vendor shall (i) give access to such Confidential Information solely to those employees with a need to have access thereto; and (ii) take the same security precautions to protect against disclosure or unauthorized use of such Confidential Information that the party takes with its own confidential information but, in no

event, shall a party apply less than a reasonable standard of care to prevent such disclosure or unauthorized use.

26 Consequential Damages:

Unless otherwise specified, neither Party shall be responsible for and nor shall be liable to the other Party for indirect/consequential losses and damages suffered by such Party including for loss of use, loss of profit whether such liability or claims are based upon any negligence on the part of the other Party or its employees in connection with the performance of the Purchase Order.

27 New Legislation (The Micro, Small and Medium Enterprise Development Act 2006)

- a. This Act has been enacted and made effective from 2nd October 2006. The Interest on Delayed Payments to Small Scale and Ancillary Industrial Undertaking Act, 1993 is repealed.
- b. Vendor is requested to inform the purchaser if vendor fall under The Micro, Small and Medium Enterprises Development Act, 2006 legislation and provide the purchaser, registration number and date to enable purchaser to take necessary care. The vendors are also requested to mention the same on their invoice / bill.

28 Relation between parties:

The Purchase Order shall be entered into on a principal-to-principal basis only. The Purchase order shall not be construed as a partnership or an association of persons. There is no agent and principal relationship between the parties. Each party shall be responsible for its own conduct. The Vendor shall ensure at all times that all the work carried out under this contract either by its own person or through any of its sub-Vendors shall be always done under its own direct supervision.

29 Environment / ISO 14001 Certification:

The Vendor to confirm whether their organization is ISO 14001 certified. If not, the Vendor must certify that the handling, use and disposal of their product / by-products conform to practices consistent with sound environmental management and local statutes. The Vendor shall ensure that all the wastes are disposed in environmental friendly way with strict compliance to applicable laws including

adherence to MoEF guidelines with respect to disposal of batteries, lead waste, copper cables, ash, waste oil, e-waste etc which shall be disposed through MoEF approved parties only. The Vendor shall also be responsible to collect and recycle all the e-waste generated at the end of the product life cycle at its own costs and risks as per the MoEF guidelines/ orders.

30 Tata Code of Conduct

The Purchaser abides by the Tata Code of Conduct in all its dealing with stake holders and the same shall be binding on the Purchaser and the Vendor for dealings under this Purchase Order. A copy of the Tata Code of Conduct is available at our website: <http://www.tatapower.com/aboutus/code-of-conduct.aspx>. The Vendor is requested to bring any concerns regarding this to the notice of our Chief Ethics Officer on the e-mail ID: cecounsellor@tatapower.com.

31 Responsible Supply Chain Management:

The Purchaser is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy. The Vendor is required to comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations. The Purchaser encourages its Vendors/ Contractors/ Business partners to pay more attention to green design, green supply, green production, green logistics and green packaging in performing their business obligations.

The Vendor is required to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy.

A copy of the Responsible Supply Chain Management Policy along with Environment policy, Energy Conservation policy, Sustainability policy, Health & Safety policy and Human Rights policy is available at website: <http://www.tatapower.com/sustainability/policies.aspx>.

Vendor/Bidder is required to completely fill the attached "Supplier Sustainability Questionnaire" in support of their Green Supply Chain Management initiatives and submit the same with their offer.

The Owner recognizes that diversity in the workplace positively impacts business. The Owner is committed to help people from SC/ST background either by helping them to become entrepreneurs or by engaging workforce from SC/ST community under the contracts agreed herein. To encourage engaging SC/ST community, the owner may consider on the merit to incentivize the Contractor by paying additional 1% of the service contract portion if the number of SC/ST workforce engaged in the contract exceeds 30% of the total deployed strength and 2%, if the strength goes beyond 50%. While the Contractor will assist the workforce so engaged to become self-reliant in meeting the work expectation, the Owner may also volunteer its training resources to the extent possible to improve their employability. The Contractor shall maintain the proper documentation of such category of the workforce engaged and the owner may consider to pay the incentive after its verification.

The Owner may also consider extending price preference of 5% in the bid evaluation for an order value up to Rs.50 Lacs, provided the company is owned by a person from SC/ST community having minimum 50% holding in the company.

32 Vendor rating

You are requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Your performance with respect to the said factors will be taken into consideration for future business.

33 Vendor Feedback:

- 33.1 In this dealing Vendors feedback is important for the purchaser to improve its processes. If vendor have to report any grievance, problem or require any clarification, information, vendor is requested to contact purchaser at email ID: CC_CUSTOMERFEEDBACK@tatapower.com
- 33.2 Vendor is requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Vendor performance with

respect to the said factors will be taken into consideration for future business.

34 Non-Waiver:

Failure of Purchaser or its representatives to insist upon adherence to any of the terms or conditions incorporated in the Contract or failure or delay to exercise any right or remedies herein or by law accruing, or failure to promptly notify the Vendor in the event of breach or the acceptance of or the payment of any Material(s) hereunder or approval of any design or Material(s) shall not release the Vendor and shall not be deemed a waiver of any right of Purchaser to insist upon the strict performance thereof or of any of its rights or remedies as to any such Material(s) regardless of when the Material(s) are shipped, received or accepted not shall any purported oral modification or revisions of the Contract by Purchaser or its representative(s) act as waiver of the terms hereof.

35 Repeat Order:

Purchaser may place the repeat order for 100% of ordered quantities within a span of 6 months from the date of issue of this Purchase Order & Vendor shall execute it at same rates, terms and conditions.

36 Severability

If any provision of this Contract is invalid, unenforceable or prohibited by law, this Contract shall be considered divisible as to such provision and such provision shall be inoperative and shall not be part of the consideration moving from any Party hereto to the others, and the remainder of this Contract shall be valid, binding and of like effect as though such provision was not included herein.

ESG FRAMEWORK FOR BUSINESS ASSOCIATES

Tata Power's Sustainability philosophy sits at the core of its Business Strategy. Tata Power Sustainability Model has an overarching objective of 'Leadership with care' with key elements of 'Care for the Environment'; 'Care for the Community'; 'Care for our Customers / Partners' and 'Care for our People'. These sustainability objectives encompass the Environmental, Social and Governance objectives driven as integrated elements.

Tata Power, together with its stakeholders is determined to achieve sustainable growth while creating shared value for all.

As a part of future ready roadmap, Tata Power has targeted following as our Environment, Social and Governance priorities:

- Being Carbon Net Zero before 2045
- Growing Clean capacity (80% by 2030)
- Customer centricity
- Becoming water neutral before 2030
- Achieving zero waste to landfill before 2030
- No net loss of biodiversity before 2030
- Positively impacting 80 million lives by 2027

In order to create a sustainable business ecosystem, Tata Power expects that all its Business Associates (BA) which includes its suppliers, vendors, consultants and service providers to align to its ESG and sustainability commitments.

Tata Power encourages improved efficiencies and scaling up of green initiatives through technology and innovation taking us farther on the journey of reducing carbon emissions and preparing the entire eco-system towards products and services that would have net positive impact on the environment and communities that we operate in.

The Vendors/ bidders wishing to associate with Tata Power are expected to share their own sustainability and ESG journey. We at Tata Power promote all Business Associates to have a sustainable procurement policy for their supplier and service providers to contribute to our integrated approach in achieving a sustainable supply chain. The BA is encouraged to carry out the assessment of their sub-contractors and sub-vendors on sustainability readiness so that they are aware of the expectation/ business requirement.

The Vendor/ Bidder shall fill-in the 'Environment, Social and Governance Compliance Screening Questionnaire for Business Associates' attached at Annexure-I and submit the same along with the Bid in Ariba online platform.

Responsible Supply Chain Management:

Tata Power is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy.

Tata Power Business Associate (BA) shall comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations.

Tata Power encourages its BA to focus on green design, green supply, green production, green logistics and green packaging in performing their business obligations. The BA is expected to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy (enclosed with this document as Annexure-II).

The BA is expected to:

- Strive towards Conservation of Energy, Water, Resources and optimize transportation of Men & Materials to minimize environmental impact and reduce carbon footprint.
- Carry out the assessment of materials used for construction, operation & maintenance, consumables and accordingly phase out those materials which are environmentally hazardous.
- Be cognizant that diversity in the workplace positively impacts business.
- Promote affirmative action by supporting people from SC/ ST background by engaging workforce from SC/ ST community under the contracts agreed herein.
- Share the commitment of 'No child labour', 'No forced labour', Non-discrimination on the basis of caste, colour, religion, gender, disability, maternity or pregnancy or any other factor unrelated to the requirements of the job
- Pay the wages or remuneration to the workforce, personnel deployed in compliance to all applicable laws and regulations.
- Provide its employees/ deployed labor with an employment environment that is free of physical or psychological harassment.
- Carry out the assessment of their Sub-contractors on their Sustainability Readiness so that they are aware of the above expectation/ standards
- To ensure usage of suitable package material which is more environmentally sustainable. Further the packing material shall be recycled to the extent possible. The material used for packing is expected to suit the mode of transport and to ensure its safe receipt at point of delivery.

Waste Disposal:

The BA is expected to follow best practices for disposal of waste, few of which are listed below:

- Have a detailed project plan that includes the waste management, segregation of all designated waste material (Recyclable/ Non-Recyclable), collecting, storing, disposing and transferring the same to pre-arranged facility/ destination in timely and safe manner as per environmental legislations. The project plan shall also include the innovative construction practice to eliminate or minimize waste, protect surface/ground water, control dust and other emissions to air and control noise.
- Have purchase policy to encourage the procurement of material with recycled and minimum packaging of goods during delivery and appropriate means for site-to-site transportation of materials to avoid damage and litter generation.
- Ensure that the residents living near the site are kept informed about proposed working schedule and timings/ duration of any abnormal noise full activity that is likely to happen.
- Ensure the regular maintenance and monitoring of vehicles and equipment for efficient fuel use so that emissions and noise are within acceptable limits to avoid air pollution.

Water Management:

The BA is expected to follow best practices for water management, few of which include a management and monitoring system for water withdrawals and consumption, procedures to reduce water usage or reuse/recycle water, and pretreatment of wastewater before disposal.

Compliance to Law:

The BA shall adhere to responsible business practices and comply with the provision of all the Statutory Acts Applicable. Special attention of the BA is drawn towards the compliance of provision of the following statutes: (along with the latest amendments/additions, as applicable):

- The Child Labour (Prohibition and Regulation) ACT, 1986.
- The Contract Labour (Regulation and Abolition) ACT, 1970.
- The Employee's Pension Scheme, 1995.
- The Employee's Provident Funds and miscellaneous provisions Act, 1952.
- The Employees State Insurance Act, 1948.
- The Equal Remuneration Act, 1976.
- The Industrial Disputes Act, 1947.
- The Maternity Benefit Act, 1961.
- The Minimum Wages Act, 1948.
- The Payment of Bonus Act, 1965
- The Payment of Gratuity Act, 1972.
- The Payment of Wages Act, 1936.
- The Shops & Establishment Act, 1954.
- The Workmen's Compensation Act, 1923.
- The Employer's Liability Act, 1938.
- and any other applicable statutory act

Social Accountability (SA 8000):

Tata Power expects its BAs to follow guidelines of SA 8000:2014 on the following aspects

- Child Labour
- Forced or Compulsory Labour
- Health & Safety
- Freedom of Association & Right to Collective Bargaining
- Discrimination
- Disciplinary Practices
- Working Hours
- Remuneration
- Management System

Health and Safety

The BA is expected to ensure the health and safety of his and his Sub-contractor's staff and labour. The BA shall, in collaboration with and according to the requirements of the local health authorities, ensure that medical staff, first aid facilities, sick bay and ambulance service are available at the accommodation and on the Site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The BA shall maintain records and make reports concerning health, safety and welfare of persons deployed, and damage to property, as the Owner's Representative may reasonably require. The BA shall be responsible for the medical treatment / hospitalization of his and his Sub-contractor's staff/ labour.

The BA shall appoint a qualified Safety officer at the Site to be responsible for maintaining the safety, and protection against accidents, of all personnel on the Site. Such Safety officer shall have the authority to issue instructions and take protective measures to prevent accidents.

The BA shall comply in toto with the Tata Power's Contractor Safety Terms & Conditions, Health Safety & Environment Manual while working on Tata Power Site/ Services/ Contracts.

Grievance Mechanism

The BA is expected to have grievance procedures that allow stakeholders to anonymously bring environmental and/or work-related violations and/or concerns to the attention of management. In addition, the BA is expected to have procedures for examining reports of environmental and/or work-related violations or concerns and/or privacy complaints.

Data Protection

The BA is expected to have a formal process to address data security or privacy issues.

ANNEXURE-I



Sr. No.	Question Description	Response (Y/N)	Remarks
Organization			
1	Does your Company have Sustainability Policy at Organization Level? If Yes, Please attach		
2	Do you have sustainable procurement policy in place for your own suppliers? If Yes, Please attach		
3	Does your company do regular assessment of its suppliers on ESG parameters?		
4	Are there ESG risks, or negative impacts identified in your supply chain		
Governance			
1	Is diversity taken into consideration when appointing board members/ senior management? Do you have an independent director/s?		
2	Has your company taken initiatives to ensure ethical practices at workplace? Please share the details, Policies etc.		
3	Does your company have a formal process to address data security or privacy issues? Please share the details, Policies etc.		
4	Does your company have grievance mechanism for stakeholder issues and track resolution?		
Environment/ Planet			
1	Does your company have Environmental Policy? If Yes, Please attach		
2	Do you have a formal process for waste management including solid wastes, liquid wastes and hazardous waste?		
3	Does your company track greenhouse gas emission? Also, what percentage of own consumption comes from the renewable energy?		
4	Does your company have a formal process for water management including monitoring of water consumption and withdrawals, and if applicable, pretreatment of wastewater?		
Green Technology/ Innovation			
1	Are your facility/ Product/ Services provided by you is based on green design, green production, green packaging or green logistics considerations? Please elaborate.		
2	Do your products or services have any environmental or social features or benefits (e.g. environmental/energy certification, ecolabels, fair trade certification, etc.)?		
Social/ People			
1	Does you facility/ Company have written personnel policies in place Are you an equal opportunity employer?		
2	Please describe any formal programme / campaign in place to promote company involvement with the community (volunteering, etc.). What is the percentage of profit spend on community activities?		
3	Does your company have a written Health & Safety Policy or Program? If Yes, Please attach		
Certifications: Does your company have following certifications (valid till date-please mention validity)			
1	ISO9001 accreditation		
2	SA8000 or equivalent		
3	ISO 14001 certification		
4	ISO 18001/45001 or equivalent		
5	ISO/IEC 27001 or equivalent		
6	Any Other (Please specify)		

Signature

Business Associate Name

ANNEXURE-II

CORPORATE SUSTAINABILITY POLICY

At Tata Power, our Sustainability Policy integrates economic progress, social responsibility and environmental concerns with the objective of improving quality of life. We believe in integrating our business values and operations to meet the expectations of our customers, employees, partners, investors, communities and public at large

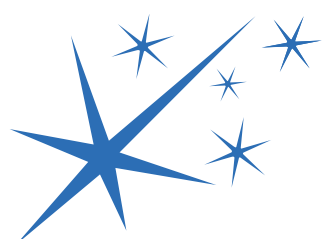
- We will uphold the values of honesty, partnership and fairness in our relationship with stakeholders
- We shall provide and maintain a clean, healthy and safe working environment for employees, customers, partners and the community
- We will strive to consistently enhance our value proposition to the customers and adhere to our promised standards of service delivery
- We will respect the universal declaration of human rights, International Labour Organization's fundamental conventions on core labour standards and operate as an equal opportunities employer
- We shall encourage and support our partners to adopt responsible business policies, Business Ethics and our Code of Conduct Standards
- We will continue to serve our communities:
 - By implementing sustainable Community Development Programmes including through public/private partnerships in and around our area of operations
 - By constantly protecting ecology, maintaining and renewing bio-diversity and wherever necessary conserving and protecting wild life, particularly endangered species
 - By encouraging our employees to serve communities by volunteering and by sharing their skills and expertise
 - By striving to deploy sustainable technologies and processes in all our operations and use scarce natural resources efficiently in our facilities
 - We will also help communities that are affected by natural calamities or untoward incidence, or that are physically challenged in line with the Tata Group's efforts

The management will commit all the necessary resources required to meet the goals of Corporate Sustainability.



(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018



Supplier Code of Conduct

Tata Power follows the Tata Code of Conduct (TCoC) and the Whistle blower Policy and expect all its Suppliers to adhere to the same principles. “**Supplier**” here means any business, company, corporation, person or other entity that provides, sells or seeks to sell, any kind of goods or services to Tata Power, including the Supplier’s employees, agents and other representatives.

Tata Code of Conduct- (TCoC): <https://www.tatapower.com/pdf/aboutus/Tata-Code-of-Conduct.pdf>

Whistle Blower Policy: <https://www.tatapower.com/pdf/aboutus/whistle-blower-policy-and-vigil-mechanism.pdf>

Anti-Bribery & Anti-Corruption Policy: <https://www.tatapower.com/pdf/aboutus/abac-policy.pdf>

The suppliers are expected to adhere to the following Do’s and Don’ts:

Do’s

1. The Suppliers shall be committed to supplying products and services of high quality that meet all applicable standards and laws, including product packaging, labelling and after-sales service obligations.
2. Comply with all applicable laws and regulations, both in letter and in spirit, in all the territories in which it operates.
3. Strive to provide a safe, healthy and clean working environment for its employees.
4. Strive for environmental sustainability, particularly with regard to the emission of greenhouse gases, consumption of water and energy and the management of waste and hazardous materials.
5. The Supplier shall represent our company (including Tata brand) only with duly authorised written permission from our company.
6. Safeguard the confidentiality on the use of intellectual property, information and data of the Company.
7. Gifts and hospitality given or received should be modest in value and appropriate as per Company Policy.
8. The assets of Tata Power shall be employed primarily and judiciously for the purpose of conducting the business for which they are duly authorised.
9. All actual or potential conflicts due to financial or any other relationship with a Tata Power employee shall be disclosed.

Don’ts

1. The Supplier shall not make unfair or misleading statements about the products and services of competitors.
2. Children shall not be employed at workplaces.
3. Forced labour shall not be used in any form.
4. The Suppliers shall neither receive nor offer or make, directly or indirectly, any illegal payments, remunerations, gifts, donations or comparable benefits that are intended, or perceived, to obtain uncompetitive favours for the conduct of its business with Tata Power.

Reporting Violations

The Supplier shall notify the Company regarding any known or suspected improper behaviour of other suppliers or employees relating to its dealings with Tata Power, by email to: cecounsellor@tatapower.com. The same can also be raised through our 3rd party ethics helpline facility:

Toll-free Number	1800 267 4065
Email	tatapower@tip-offs.in
Website & Chatbot	www.tatapower.tip-offs.in
Postal address	Attn to: Mr. Puneet Arora, Deloitte Touch Tohmatu India LLP, 6 floor, AIPL Business, Sector 62, Gurugram, Haryana 122102

CYBERSECURITY COMPLIANCE

The Vendor unconditionally undertakes, for the entirety of the contract term and the warranty / support period, to comply with the cybersecurity obligations set out below. Acceptance of this clause is a condition precedent to award; non-compliance constitutes a material breach.

1. Universal Obligations — applicable to all Vendors and all supplies

- (a)** ISO/IEC 27001:2022 certification covering the supply scope is maintained current; where the supply includes vendor develop software, firmware, or a vendor operated software solution, an independent third-party VAPT of the offered solution has been conducted within the last 12 months (this VAPT requirement does not apply to distributors reselling OEM hardware such as laptops, switches, routers, and similar IT/OT and networking equipment's).
- (b)** No private Wi-Fi, personal hotspots, 4G/5G modems, unmanaged switches, or unauthorised broadband shall be deployed at Tata Power sites. All remote access shall be conducted exclusively through Tata Power's approved Secure Remote Access (SRA) solution and processes defined.
- (c)** MFA is enforced for privileged and remote access; integration with enterprise IAM (SAML 2.0 / AD / LDAP) is supported; RBAC under least privilege is applied; dedicated named accounts are used (no shared Vendor credentials); hardcoded or default credentials are prohibited in production; data is encrypted at rest using AES-256 (or equivalent) and in transit using TLS 1.2 or higher, with SSL / TLS 1.0 / 1.1 disabled.
- (d)** All operational, configuration, and diagnostic data remains the sole property of Tata Power; the supplied solution contains no hidden telemetry, backdoors, undisclosed data collection, or background cloud synchronisation.
- (e)** For IT solutions and applications, security patches shall be provided within: Critical (CVSS $\geq$ 9.0) 15 days; High (7.0–8.9) 30 days; Medium (4.0–6.9) 60 days; Low ($<$ 4.0) 90 days. For OT solutions, security patches for vulnerabilities with a CVSS score above 8.0 shall be provided to Tata Power as and when released by the OEM / Vendor, after due testing in a representative environment to prevent operational instability. Zero-Day interim mitigation is issued within 24–48 hours of internal discovery. Not less than 12 months' written notice of any EOL / EOS milestone shall be given.
- (f)** Tata Power shall be notified of any confirmed or suspected security breach within 4 hours of discovery, with full cooperation for CERT-In's 6-hour mandate.

2. Conditional Obligations — applicable where the supply category applies

- (a)** IT Software / Firmware (where the supply includes Vendor-developed software or firmware): A documented SSDLC with SAST, DAST, and SCA gates is operated; a machine-readable SBOM is delivered identifying all components, versions, licences, and known CVEs at delivery.

- (b) IT Hardware & Endpoints** (servers, workstations, laptops, network equipment): EDR / AV with 3 years of free updates is bundled, or formal compatibility with Tata Power's chosen EDR / AV with central manager is declared; Windows endpoints are hardened to CIS Benchmark Level 1; BIOS / UEFI password protection is enabled; boot-from-external-media is disabled; USB ports are lockable; unused ports, services, and default accounts are disabled and documented; shipments arrive in tamper-evident packaging.
- (c) Operational Technology / ICS** (PLCs, RTUs, IEDs, SCADA, EMS, DCS, HMIs, OT firewalls, MES, SIS, engineering workstations and OT endpoints/computers): IEC 62443-4-1 and 4-2 compliance is held or independently assessed; architecture aligns with the Purdue Model with a Communication Matrix; MES-to-OT exchanges traverse approved OT firewalls (no direct IT-to-Level 1 / 2 connectivity); Secure Boot with cryptographic firmware validation; offline patching via removable media or local update server (no internet dependency); SIS is physically and logically segregated from BPCS (no shared credentials, networks, or power); secure industrial protocols supported (DNP3 SAv5, IEC 61850 with TLS, OPC-UA SignAndEncrypt) — Telnet, FTP, SNMP v1 / v2c, unencrypted HTTP, rsh, rlogin are not used on any OT segment; application whitelisting enabled on HMIs by default; all OT project files (PLC / DCS / RTU programs, HMI projects, SCADA exports, IEC 61850 SCL / CID / SCD files, network device configs, SIS files) are delivered in native and vendor-agnostic formats at handover and refreshed after every configuration change. Cybersecurity compliance during FAT and SAT is a condition of acceptance; non-conformance entitles Tata Power to reject equipment without commercial impact, with any re-FAT / re-SAT at Vendor's cost.
- (d) Cloud / SaaS** (solutions hosted outside Tata Power's infrastructure): A current SOC 2 Type II report or ISO 27017 / 27018 certification covers the offered service; all data processing, storage, and transmission occurs exclusively within India unless explicitly approved in writing by the Tata Power CISO and Legal teams.
- (e) Personal Data Processing** (any solution processing personal data on behalf of Tata Power, regardless of hosting model): The Digital Personal Data Protection Act, 2023 is complied with; a Data Processing Agreement defining data categories, retention, deletion, sub-processor disclosure, and the Vendor's processor role shall be executed prior to go-live.

3. Remedies, Indemnity, and Survival

- (a)** Any false, misleading, or materially incomplete declaration, or any material non-compliance with this clause, shall entitle Tata Power to: (i) disqualify the bid; (ii) terminate any awarded contract for material breach; (iii) forfeit bid security and performance guarantees; (iv) blacklist the Vendor for a period determined by Tata Power; and (v) pursue such other legal recourse, civil or criminal, as may be available.
- (b)** The Vendor shall indemnify Tata Power against losses, penalties, damages, regulatory fines, and reasonable legal costs arising from a security breach attributable to the Vendor's negligence or non-compliance with this clause.
- (c)** Sub-clauses 1(d), 1(f), 2(d), and 2(e) shall survive expiry or termination of the contract for the period during which Tata Power data remains in the Vendor's custody, or any obligation remains capable of giving rise to a cause of action, whichever is longer.

The Tata Power Company Limited is hereunder referred to as the "Owner" or "Company". The person, firm or company offering the services, the subject of this order is referred to as "Contractor". The subject of this order is hereinafter referred to as the "Work".

"Sub-Contractor" means any person named in the Contract as a Sub-contractor, sub-vendor, manufacturer or supplier for a part of the Works or any person to whom a part of the Works has been subcontracted and the legal successors in title to such Person, but not any assignee of such Person.

The Contract shall mean the contract as derived from the following:

1. Work Order (with 'Commercial Notes' and Annexures to the Work Order referred thereon)
2. Scope of Work.
3. General Terms & Conditions - Service

The documents including all reference document (s) and Annexures forming the Contract are to be read together as a whole and are to be taken as mutually explanatory, provided however, in the event of any inconsistency or discrepancy between the aforementioned documents, the order of precedence in interpretation of the documents shall be as set out above. For the avoidance of doubt, it is clarified that the terms set forth in the Work Order (with 'Commercial Notes' and Annexures to the Work Order referred thereon) shall take precedence over the terms set out in the Scope of Work, which shall in turn take precedence of the terms set out in the General Terms & Conditions – Service.

1. Contractor's obligation:

- 1.1 Contractor warrants that it is a competent, qualified and experienced contractor, equipped, organised and financed to perform and complete the services in the operating area in an efficient and professional manner and capable of meeting all the requirements of the Contract.
- 1.2 The Contractor has the overall responsibility of executing the contract, conducting Planning, Job Scheduling, Maintenance Planning, Maintenance Job Scheduling, executing the Work and maintenance jobs as per the Scope of work & schedule.
- 1.3 Except to the extent that it may be legally or physically impossible or create a hazard to safety, the Contractor shall comply with the Owner's representative(s) instructions and directions on all matters relating to the Work.
- 1.4 Contractor shall at all times have full responsibility for control of the Equipment and for the direction and supervision of operations being carried out under the Contract.
- 1.5 In the performance of the Work, Contractor shall be and act as an independent Contractor fully responsible and accountable for the proper execution of its responsibilities, obligations and

liabilities under this Contract and for its own acts and the acts of its Sub-Contractors and the Personnel. Owner's supervision, examination or inspection of the (performance of the) Work or omission to carry out the same shall not be construed in any manner whatsoever as relieving Contractor from its responsibilities, obligations or liabilities under this Contract.

- 1.6 Contractor shall submit list of tools & tackles with details of make, year of manufacturing, valid certification to the Project Manager/ User for their approval.

Project Manager may during the execution of project inspect & verify that the tools & tackles are as per the qualification requirements approved by him and will have right to seek replacements in case of any discrepancies. The Contractor shall always comply with such directives.

- 1.7 Contractor shall engage Tata Power Skill Development Institute (TPSDI) certified labour force at the site for execution of the job. Requirement & fees for TPSDI certification shall be as per Company Policy.
- 1.8 Contractor shall take full responsibility for the protection and security of Owner's materials and equipment while such materials and equipment are temporarily stored in Contractor's facility or otherwise in Contractor's custody.
- 1.9 All notices, instructions, information, and other communications given by the Contractor to Owner under the Contract shall be given to the Order Manager/ Owner's representative, except as otherwise provided for in this Contract.
- 1.10 The Contractor shall make its own arrangements for movement of personnel and equipment, within and outside the sites / units / offices at the various locations covered by the Contract.
- 1.11 The Contractor shall acquire in its name all permits, approvals, and/or licenses from all local, state, or national government and other statutory authorities and/or public service undertakings that are necessary for the performance of the Contract.
- 1.12 Neither the Contractor nor its personnel shall during the term of this Contract, engage in any business or professional activities in India/abroad which would conflict with the activities assigned to them under this Contract.

2. Service Warranties:

Contractor warrants that all services performed for or on behalf of Owner will be performed in a competent,

workmanlike manner and shall be free from faults and defects. Said warranties shall be in addition to any warranties of additional scope given by Contractor to Owner. None of said warranties and no other implied or express warranties shall be deemed is claimed or excluded unless evidenced by a change notice or revision issued and signed by Owner's authorized representative.

3. Compliance of Local Laws:

Contractor shall be responsible and shall comply with the provision of all the Statutory Acts Applicable. Special attention of the Contractor is drawn towards the compliance of provision of the following statutes: (along with the latest amendments/additions, as applicable):

- a) The Child Labour (Prohibition and Regulation) ACT, 1986.
- b) The Contract Labour (Regulation and Abolition) ACT, 1970.
- c) The Employee's Pension Scheme, 1995.
- d) The Employee's Provident Funds and miscellaneous provisions Act, 1952.
- e) The Employees State Insurance Act, 1948.
- f) The Equal Remuneration Act, 1976.
- g) The Industrial Disputes Act, 1947.
- h) The Maternity Benefit Act, 1961.
- i) The Minimum Wages Act, 1948.
- j) The Payment of Bonus Act, 1965
- k) The Payment of Gratuity Act, 1972.
- l) The Payment of Wages Act, 1936.
- m) The Shops & Establishment Act, 1954.
- n) The Workmen's Compensation Act, 1923.
- o) The Employer's Liability Act, 1938.
- p) and any other applicable statutory act

Site Specific requirements shall be as Annexure at I. The compliance to these Site Specific requirements shall not absolve the Contractor of its obligation to comply with the Owner's Contractor Safety Management Policy.

4. Owner's Obligation:

- 4.1 The order manager (As specified in the 'Commercial Notes') shall have the authority to represent Owner on all day-to-day matters relating to the Contract or arising from the Contract. All notices, instructions, orders, certificates, approvals, and all other communications under the Contract shall be given by the order manager, except as otherwise provided for in this Contract. The order manager may appoint the Engineer-In-Charges for different areas for monitoring the work progress, inspections and signing of bills.

- 4.2 Owner shall ensure the availability of site access, all information and/or data to be arranged/ supplied by Owner to the Contractor for execution of the Work. The terms on which the Contractor shall be allowed access to the site shall be specified by the Owner prior to commencement of the execution of the Work and thereafter shall be governed in accordance with such policies as the Owner may provide in writing to the Contractor from time to time.

5. Contractor's/ Sub-contractor's employees:

- 5.1 The Contractor shall engage appropriately qualified persons to provide the services with the prior approval of Owner. Owner may withhold such approval for any reason whatsoever.
- 5.2 The Contractor hereby represents and warrants that:
 - i) the personnel are duly qualified, and are, and will remain, sufficiently qualified, careful, skilful, diligent and efficient to provide the services to Owner; and
 - ii) the Services will be rendered carefully, skilfully, diligently and efficiently, and to the professional standard reasonably expected by Owner of a contractor qualified and experienced in providing services substantially the same as the Services.
- 5.3 The Contractor must ensure that the Contractor's personnel conduct themselves in a proper manner and comply with the procedures and all policies, regulations and directives of Owner including any occupational, health and safety policies and the relevant prevailing laws and regulations in the Country of operations and specifically in the area where Work is being executed.
- 5.4 Owner may inform the Contractor to immediately remove Contractor's personnel from the relevant premises in the event of misconduct or incompetence on the part of the Personnel. The Contractor shall at all times remain liable for all acts and/or omissions of its Personnel.
- 5.5 It is made clear that no relationship of Owner and employee is created between Owner and the Contractor's resident engineers, employees and no claim for employment of any such personnel shall be tenable or entertained.

6. Title of Property:

- 6.1 Unless otherwise provided in this order or agreed to in writing, property of every description including but not limited to all tooling, tools, equipment and material furnished or made available to Contractor, title to which is

in Owner, and any replacement thereof shall be and remain the property of Owner. Such property other than material shall not be modified without the written consent of Owner. Such property shall be plainly marked or otherwise adequately identified by Contractor as being owned by Owner and shall be safely stored separately and apart from Contractor's property.

- 6.2 Contractor shall not use such property except for performance of work hereunder or as authorized in writing by Owner. Such property while in Contractor's possession or control shall be listed in writing and kept in good condition, shall be held at Contractor's risk, and shall be kept insured by Contractor, at its expense, in an amount equal to the replacement cost with loss payable to Owner. To the extent such property is not material consumed in the performance of this order, it shall be subject to inspection and removal by Owner and Owner shall have the right of entry for such purposes without any additional liability whatsoever to Contractor. As and when directed by Owner, Contractor shall disclose the location of such property, prepare it for shipment and ship it to Owner in as good condition as originally received by Contractor, reasonable wear and tear excepted.

7. Work Completion schedule:

Contractor shall plan and execute the Work in accordance with a detailed schedule mutually agreed upon by the Parties (Owner and Contractor).

8. Contract Price and Payment:

- 8.1 The Contract Price shall be a firm & fixed Contract Value for the Work inclusive of all the taxes, levies & duties and shall remain firm till the validity of this contract.
- 8.2 Unless Specifically stated elsewhere in the contract, the Contractor is solely liable for payment of , and warrants that it will pay, or ensure the payment of all taxes imposed, assessment made in relation to the Work.
- 8.3 An amount as stated in the table below shall be retained towards Contractor's safety performance against every RA bill:

Contract Value	Retention Amount (%)
Upto Rs. 10 lakhs	2.5
Above Rs. 10 lakhs and below Rs. 50 lakhs	2
Above 50 lakhs and upto Rs. 10 Crores	1.5
Above Rs. 10 Crores	1

The above mentioned safety retention shall be over and above any other retentions/ deferred payments as may have been specifically agreed in the Contract.

- 8.4 For Contract Price Rs. 1 crores or above and Contract Completion Schedule 12 months or more, the above safety retention will be released half yearly against the Safety Performance Score (methodology for evaluation enumerated in the Safety Terms & Conditions attached as Appendix to this General Terms & Condition) which will be evaluated by the Order Manager every month. For all other contracts, the above said safety retention shall be released along with the final settlement only at the end of the contract period.
- 8.5 The Owner shall have the right to stop any work which in its opinion is not meeting the safety standards/ guidelines of the Owner and good engineering practice. The Contractor shall not be eligible for and shall not be granted any extension in Completion Schedule due to such stoppage of work by the Owner.
- 8.6 The above retention towards safety shall not absolve the Contractor of its liabilities including statutory liabilities towards safety violations, injury or death (whether by accident or otherwise). An amount between Rs. 5 to 50 lakhs as deemed appropriate by Owner's appointed Committee for incident investigation and/ or as determined by statutory authorities (whichever higher), will be payable by the Contractor in case of such severe incidents of injury leading to loss of property or partial/ permanent disablement (e.g. loss of limb/s, vision etc.) or death.
- 8.7 Notwithstanding anything else stated in the Contract, the Contractor shall be liable for termination without any notice and without recourse to Owner in case of three (3) or more severe safety violations. There shall be no termination fees/ compensation payable to Contractor for such termination.
- 8.8 In case the Contractor achieves 100% on the Safety Performance Score, the Contractor shall be awarded a discretionary bonus of 1% of invoiced value subject to a maximum of Rs. 50 lakhs towards Safety Performance.
- 8.9 Payment shall be released within 60 days of submission of error free invoice with supporting documents duly certified by the Order Manager/ Engineer-in-Charge after deducting taxes at source as prescribed under the applicable law, income – tax or other deductions under the state value added tax laws . If such payment release

day falls on a holiday of Owner, payment will be released on the next working day. Against deduction of statutory taxes, tax deduction certificates where ever applicable shall be issued as per the applicable provisions of the statute. The Order Manager may recover any amount wrongly paid in excess in any previous bills certified by him.

- 8.10 *Mode of Payment:* All payments shall be made direct to the Contractor or his authorized representative in the shape of RTGS or Electronics Transfer method, on certification of the Order Manager/Engineer-in-Charge and on compliance of contractual terms & conditions.

9. **Taxes and Duties:**

- 9.1 The Contract Price shall be inclusive of all taxes, duties, including but not limited to Customs duty, GST or any local taxes, levies imposed by State/Central/Local governments.

- 9.2 Taxes as mentioned in the Contract Price or Price Schedule shall be paid to the contractor subject to the Contractor complying with all the statutory requirements and furnishing the relevant documents including error free invoices containing detailed break up of the taxes.

- 9.3 The tax invoices should contain the details to comply with the GST Law. The supplier shall:

- i) Furnish (electronically) and communicate to the Owner, the details of Goods or Services supplied by the 10th of the month succeeding the said tax period,
- ii) Upon discovery of any discrepancy, rectify it and shall pay the tax and interest thereof,
- iii) Furnish the returns (electronically), for the inward and outward supplies of Goods and/or Services, before the specified dates as per the GST Law,
- iv) Communicate the tax paid, credits etc. as and when credited.
- v) The Invoice should clearly state the description of the goods, quantity, sale price, tax %, and tax amount;
- vi) The Invoice should be signed by an Authorized Signatory.

Bills/Invoices in the name of The Tata Power Company Ltd. with packing lists in triplicate shall be forwarded along with the equipment.

Contractor to furnish GST Registration no. in all invoices as well as Purchaser's (Tata Power's) GST no.

- 9.4 However the payment of tax shall be restricted to the total amount as indicated in the price schedule.

- 9.5 Any statutory variation in duties, levies or taxes if applicable and specified in this Contract till the scheduled date for completion of Work and limited to direct invoices of the Contractor shall be to the account of Owner. The Contractor shall have the obligation to provide the necessary documentary evidence / supporting by way of gazetted notifications etc. to prove the change in such levies or taxes between the due date of submission of the Bid and the scheduled date of completion of work to claim the difference.

- 9.6 The Contractor shall pass on to the Owner all the benefits of either reduction in tax rates, exemptions, concessions, rebate, set off, credits etc. or introduction of new tax rates exemptions, concessions, rebate, set off, credits etc. pertaining to all taxes, duties, imposts, fees and levies in respect of the supplies of Goods or performance of obligations under the contract. This would specifically include reduction of tax rates as a result of statutory changes or judicial rulings.

- 9.7 Any other taxes, levies and duties not mentioned in Contract Price or Price Schedule but applicable as per any statute (s) or introduction (omission) of new taxes, levies and duties shall be deemed to be included in the Contract Price and shall be to the account of the Contractor.

- 9.8 For facilitating availment of a credit, set-off, rebate, drawback or like benefit available to the Owner, the Contractor will facilitate the Owner by providing the necessary documentary and/or procedural support. In any process of assessment or re-assessment, of taxes payable by the Owner,

- 9.9 The Contractor shall bear and pay all the costs, liabilities, levies, interest, penalties in respect of non-compliances of any legal requirements as per various statutory provisions. The contractor shall keep the owner indemnified at all times from any tax liability, interest, penalties or assessments that may be imposed by the statutory authorities for non-compliances or non-observation of any statutory requirements by the Contractor.

- 9.10 All formalities required under statutes, for availing any concessions under relevant tax laws shall be adhered to by the Contractor.

- 9.11 Deduction at source: Recovery at source towards income tax calculated at the rate prescribed from time to time under the Income Tax Act 1961 and other relevant sections of Income Tax Act shall be made from the bills of the Contractor and the amount so recovered shall be

deposited with the Income Tax Department. Necessary TDS certificate to this effect will be issued to the Contractor in the prescribed proforma.

- 9.12 If any other taxes / duties / cess etc are to be recovered at source as per government regulations / Legislation from time to time, the same shall be recovered from the bills payable to the Contractor. Necessary receipt to this effect will be issued to the Contractor in this regard as per the applicable legislation.

10. Contract Performance Guarantees (If applicable)

The Contractor shall within 15 days of issuance of this Order/Contract furnish an unconditional irrevocable bank guarantee duly stamped, strictly as per the prescribed format of Owner from any nationalized bank or any scheduled bank having a branch in Mumbai and approved by the Owner for a sum equivalent to 10% of the Total Contract Price valid for the Contract Period and with a claim period of not less than 6 months from the completion of Contract Period. The issuing bank should be advised to send a direct confirmation of issue of bank guarantee to Owner.

In case the Contractor fails to furnish the requisite Bank Guarantee as stipulated above, then the Owner shall have the option to cancel the Contract besides other contractual remedies.

11. Price Reduction:

- 11.1 In case the Contractor fails to deliver the service/ Complete the work as per the agreed Completion Schedule including intermediate milestones (if applicable), the Owner shall recover from Contractor, as ascertained and agreed Liquidated Damages, and not by way of penalty, a sum equivalent to 1% of the Contract Value per week of delay. The Liquidated Damages referred above may be recovered by the Owner as set off against any amounts payable by the Owner to the Contractor or in any other manner in accordance with applicable laws.
- 11.2 The overall cap on liquidated damages shall be limited to 10% of the Contract Price.

12. Insurance

- 12.1 The Contractor agrees to indemnify and protect Owner against all liability, claims or demands for injuries or damages to any person or property growing out of the performance of this order/ Contract.
- 12.2 The Contractor further agrees to furnish evidence of insurance showing that Contractor has and will maintain adequate insurance coverage during the life of this Contract/ order in the opinion of Owner, including but not

limited to comprehensive general liability insurance. Such evidence of insurance must set forth the name of the insurer, policy number, expiration date, and limits of liability. Compliance by Contractor with insurance requirements does not in any way affect Contractor's indemnification of Owner under Indemnification clause

13. Indemnification:

The Contractor shall indemnify, save harmless and defend the Owner and keep the Owner indemnified from and against any and all claims, costs, liabilities (financial), litigations, compensations, judgments, expenses or damages (including attorney's fees and other related expenses) arising out of any breach or alleged breach of any of the conditions of this Contract including compliance to statutory laws of provisioned under clause 3, performance of the obligations hereunder, or any representation or misrepresentation made by the Contractor or by any third party in respect of death or bodily injury or in respect to loss or damage to any property with regard to the subject of this Contract.

14. Indemnity against IPR:

The equipment, system, drawings, and other materials that shall be supplied against the Contract will become the Owner's property. Without limitation of any liability of whatsoever nature, the Owner shall be indemnified and kept indemnified against any claim for infringement or breach of any of the statutes, rules & regulations by the use of or sale of any article or material supplied by the Contractor. The indemnity shall include any infringement of patent, trade mark, design, copyright or other property rights whether in Country of Origin, or elsewhere resulting from the Contractor's design, manufacture, use, supply or re-supply & would also cover use or sale of any article or material supplied by the Contractor to the Owner under the Contract. The Indemnity shall cover any claim/action taken by a third party either directly against the Owner or any claim/action made against the Contractor & where under the Purchaser is made liable. The Indemnity shall be for losses, damages, and costs including litigation costs, attorney fees etc incurred by the Owner in relation to the Contract.

15. Free Issue Material:

Wherever contracts envisage supply of Free Issue Material (FIM) by the Owner to the contractor for fabrication/ use in service performance, such Free Issue Material shall be safeguarded by an insurance policy to be provided by the Contractor at his own cost for the full value of such materials and the insurance policy shall cover the following risks specifically and shall be valid for six months beyond the Contract Validity date :

RISKS TO BE COVERED: Any loss or damage to the Owner's materials due to fire, theft, riot, burglary,

strike, civil commotion, terrorist act, natural calamities etc. and any loss or damage arising out of any other causes such as other materials falling on Owner's materials.

The amount for which insurance policy is to be furnished shall be indicated in the respective Contract.

Free Issue material (FIM) will be issued to the Contractor only after receipt of the Insurance Policy from the Contractor. The contractor shall arrange collection of the FIM from the Owner's premises and safe transportation of the same to his premises at his risk and cost. Notwithstanding the insurance cover taken out by the Contractor as above, the Contractor shall indemnify the Owner and keep the Owner indemnified to the extent of the value of free issue materials to be issued till such time the entire contract is executed and proper account for the free issue materials is rendered and the left over/surplus and scrap items are returned to the Owner. The contractor shall not utilize the Owner's free issue materials for any job other than the one contracted out in this case and also not indulge in any act, commission or negligence which will cause/result in any loss/damage to the Owner and in which case, the Contractor shall be liable to the Owner to pay compensation to the full extent of damage/loss. The Contractor, shall be responsible for the safety of the free issue materials after these are received by them and all through the period during which the materials remain in their possession/control/custody. The Free issue materials on receipt at the Contractor's works shall be inspected by them for ensuring safe and correct receipt of the material. The contractor shall report the discrepancies, if any, to the Owner within 5 days from the date of receipt of the material. The contractor shall take all necessary precautions against any loss, deterioration, damage or destruction of the FIMs from whatever cause arising while the said materials remain in their possession/custody or control. The free issue materials shall be inspected periodically at regular intervals by the Contractor for ensuring safe preservation and storage, the Contractor, shall also not mix up the materials in question with any other goods and shall render true and proper account of the materials actually used and return balance remaining unused material on hand and scrap along with the final product and if it is not possible within a period of one month from the date of delivery of the final product/ completion of Service covered by this Contract. The Contractor shall also indemnify the Owner to compensate the difference in cost between the actual cost of the free issue material lost/damaged and the claim settled to the Owner by the insurance company.

16. Relation between parties:

The Contract shall be entered into on a principal-to-principal basis only. The Contract shall not be construed as a partnership or an association of persons. There is no agent and principal relationship between the parties. Each party shall be responsible for its own conduct. The Contractor shall ensure at all times that all the work carried out under this contract

either by its own person or through any of its sub-Vendors shall be always done under its own direct supervision.

17. Safety:

Contractor shall comply with all legal and statutory provisions including all rules and regulations pertaining to Safety, Health and the Environment and will be responsible for all legal liabilities arising due to any of their acts or of their personnel.

The Contractor shall comply with the Owner's Contractor Safety Policy and Safety Terms and Conditions. Any misconduct and/ or violation with respect to the Owner's Contractor Safety Policy and Safety Terms and Conditions or any other legal and statutory provisions pertaining to Safety, Health and Environment shall be dealt with as per the Safety Terms and Conditions.

Prior to commencement of any work at site Contractor shall submit an undertaking in writing to adhere to and comply with all the provisions of Owner's Contractor Safety Code of Conduct.

The Contractor shall have a valid ISO 14001/ OHSAS certification. In absence of the same, the Contractor shall obtain the same within 6 months from the date of the Effective Date of Contract.

18. Suspension of Work

Owner may instruct Contractor at any time to suspend performance of the Work or any part thereof with a notice of 7 days for whatever reason. Provided Contractor is not in default under this Contract subject to Articles 1 and 5 inclusive, the Contractor shall be paid a mutually agreed fee, if any, necessarily incurred by Contractor as a direct consequence thereof of suspension and the Project Completion Schedule may be revised accordingly.

Without prejudice to any other rights Owner may have under this Contract or at law if Contractor is in default under this Contract, Owner may instruct Contractor to suspend performance of the Work or any part thereof by giving 7 days notice till such default has been corrected to the satisfaction of Owner. Also Liquidated Damages in accordance with Clause 11 shall continue to be applicable during such period until the default is cured. The costs incurred by the Contractor for such correction shall be to the Contractor's account, and furthermore no payment shall become due to the Contractor. Any cost incurred due to non - performance of the Contractor by the Owner shall be charged to the Contractor.

19. Change Management:

Owner shall have the right at any time to order any change in the Work in accordance with the following procedure. Contractor shall furnish to Owner upon request as soon as reasonably possible but no later

than five (5) days following the request, a written statement specifying:

- (a) the increase or decrease, as the case may be, in the costs of the Work which will result from a change in the Work as requested by Owner,
- (b) any effect such change in the Work may have on any other provision of this Contract originating from either parties, and
- (c) such other details as Owner may require.

Any change in costs shall be reasonably related to the proportional change in the Work and any other costs incurred by Contractor. If Owner agrees to Contractor's statement Owner shall notify Contractor thereof in writing in the form of a change order, whereupon the change in the Work shall be incorporated in the Work and immediately implemented. In the event that the change relates to a reduction in Work, the work in question shall not be undertaken pending the issue of an appropriate Change Order.

20. Governing Laws

This Contract shall be construed in accordance with and governed by the Laws of India without giving effect to any principle of conflict of law.

21. Jurisdiction

This Contract and the transaction contemplated herein shall be subject to the exclusive jurisdiction of the competent Courts in Mumbai only.

22. Dispute settlement:

Dispute or differences arising out or relating to this Order shall be resolved amicably by the parties. Failing such amicable resolution of dispute / differences either party may refer the matter to arbitration of a Sole Arbitrator to be appointed jointly by both the parties. The award of the Arbitrator shall be final, binding and conclusive on the parties. The venue for arbitration shall be Mumbai. The Arbitration proceedings will be governed and regulated by the provisions of Indian Arbitration and Conciliation Act, 1996 as amended from time to time and the rules framed there under.

23. Force majeure:

- 23.1 In the event of either party being rendered unable by force majeure to perform any obligation required to be performed by it under this Contract the relative obligation of the party affected by such force majeure shall, after notice under this articles be suspended for the period during which such cause lasts. The term 'Force Majeure' as employed herein shall mean acts of God, wars (declared or undeclared), riots or civil commotion, fire, floods, and acts and regulations of the Government of India or State Government or any of the statutory agencies. Both the party

shall pay to the other party, the amount payable upon the date of the occurrence of such force majeure.

- 23.2 Upon the occurrence of such cause and upon its termination, the party alleging that it has been rendered unable as aforesaid, thereby shall notify the other party in writing immediately but not later than twenty four (24) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of the claims.

- 23.3 During the period, the obligations of the parties are suspended by force majeure; the contractor shall not be entitled to payment of any rate.

- 23.4 In the event of the force majeure conditions continuing or reasonably expected to continue for a period more than thirty (30) days, Owner shall have the option of terminating the contract by giving seven (7) days notice thereof to the contractor.

24. Sub letting and Assignment

The contractor shall not, without prior consent in writing of the Owner, sublet, transfer or assign the contract or any part thereof or interest therein or benefit or advantage thereof in any manner whatsoever, provided nevertheless that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

25. Limitation of Liability:

Notwithstanding anything contained in the Contract, the Contractor's aggregate liability under this Contract shall be limited 100% of the Total Contract value. This shall exclude liability arising pursuant to clause 3- Compliance to Local Laws, clause 9.10, clause 14- Indemnity against IPR, clause 13- Indemnity, clause 26 – Confidentiality, liability arising due to loss of or damage to the Free Issue Material (FIM) issued by Owner to Contractor for completion of the Work and liability arising due to wilful misconduct, gross negligence, third party claims and corrupt acts attributable to the Contractor.

26. Confidentiality:

The Contractor shall use the Confidential Information of the Owner only in furtherance of this Contract and shall not transfer or otherwise disclose the Confidential Information to any third party. The Contractor shall (i) give access to such Confidential Information solely to those employees with a need to have access thereto; and (ii) take the same security precautions to protect against disclosure or unauthorized use of such Confidential Information that the party takes with its own confidential information but, in no event, shall a party apply less than a reasonable standard of care to prevent such disclosure or unauthorized use.

27. Termination:

27.1 The Contract shall be deemed to be terminated on completion of the Contract period.

27.2 Termination of default by Contractor:
Owner may terminate the contract at any time if the Contractor fails to carry out any of his obligations under this Contract. Prior to termination, the Contractor shall be advised in writing of the causes of unsatisfactory performance to be improved upon 15 days of the receipt of notice. In case, if the Contractor fails to bring about the improvement to the satisfaction of the Owner, then the Contract shall be terminated.

27.3 Without prejudice to the rights and remedies available to Owner, Owner may terminate the Contract or part thereof with immediate effect with written notice to the Contractor if:

27.3.1 The Contractor becomes bankrupt or goes into liquidation.

27.3.2 The Contractor makes a general assignment for the benefit of creditors.

27.3.3 A receiver is appointed for any substantial property owned by the Contractor.

27.3.4 The Contractor is in breach of any representation or warranty made to the Owner by the Contractor.

The Contractor shall not be entitled to any further payment under the Contract if the Contract is terminated. If the order is terminated under clause 27.2 and 27.3, the Contractor shall not be entitled to any further payment, except that, if Owner completes the Work and the costs of completion are less than the Contract Price, the Owner shall pay Contractor an amount properly allocable to services fully performed by Contractor prior to termination for which payment was not made to Contractor. In case, the cost of completion of Work exceeds the Contract Price, the additional cost incurred by Owner for such completion shall be paid by the Contractor.

27.4 Owner shall be entitled to terminate the Contract at its convenience, at any time by giving thirty (30) Days prior notice to the Contractor. Such notice of termination shall specify that termination is for Companies convenience and the date upon which such termination becomes effective. Upon receipt of such notice, the Contractor shall proceed as follows:

27.4.1 cease all further work, except for such work as may be necessary and instructed by the Owner/ Owner's representative for the purpose of preserving and protecting Work already in progress and protect

materials, facilities and equipment on the Work Site or in transit;

27.4.2 stop all further sub-contracting or purchasing activity, and terminate Sub-contracts;

27.4.3 handover all Documents, equipment, materials and spares relating to the portion of Work already executed by the Contractor or procured from other sources up to the date of termination for which the Contractor has received payment equivalent to the value thereof; and

27.4.4 handover those parts of the supplies manufactured/ work executed by the Contractor up to the date of termination.

Upon termination pursuant to clause 27.4, the Contractor shall be entitled to be paid (a) all sums properly due to the Contractor under the Contract up to the date of termination; and (b) any direct and substantiated charges already incurred or committed for cancellation of the procurement of third party goods or services which were to have been supplied by the Contractor in connection with this Contract provided that the Contractor shall use its best endeavours to minimise such charges

25.5 The Contractor shall not be released from any of his obligations or liabilities accrued under the Contract on termination. For the avoidance of doubt, the termination of the Contract in accordance with this clause shall neither relieve the Contractor of his accrued obligations for Warranty or his accrued liability to pay (liquidated) damages for Delay nor shall entitle him to reduce the value of Performance Security.

28. Consequential Damages:

Unless otherwise specified, neither Party shall be responsible for and nor shall be liable to the other Party for indirect/consequential losses and damages suffered by such Party including for loss of use, loss of profit whether such liability or claims are based upon any negligence on the part of the other Party or its employees in connection with the performance of the Contract.

29. Environment / ISO 14001 Certification:

The Contractor to confirm whether their organization is ISO 14001 certified. If not, the Contractor must certify that the handling, use and disposal of their product / by-products conform to practices consistent with sound environmental management and local statutes. The Contractor shall ensure that all the wastes are disposed in environmental friendly way with strict compliance to applicable laws including adherence to MoEF guidelines with respect to disposal of batteries, lead waste, copper cables, ash, waste oil, e-waste etc which shall be disposed through MoEF approved

parties only. The Contractor shall also be responsible to collect and recycle all the e-waste generated at the end of the product life cycle at its own costs and risks as per the MoEF guidelines/orders.

30. Non-Exclusive Agreement

This Contract is non-exclusive and Owner reserves the right to engage other contractors to perform similar or identical work. Contractor shall accord such other contractors adequate opportunity to carry out their contracts and shall accomplish the Work in co-operation with those contractors and with Owner, in accordance with such instructions as may be issued by the Owner from time to time.

31. Severability

In the event that any of the provisions, or portions or applications thereof, of this Contract are held to be unenforceable or invalid by any court or arbitration panel of competent jurisdiction, Contractor and Owner shall negotiate an equitable adjustment to the provisions of the Contract with a view towards effecting the purpose of the Contract and the validity and enforceability of the remaining provisions, or portions or applications thereof, shall not be affected thereby.

32. Housekeeping & Removal of scrap:

The Contractor shall be responsible for keeping the areas of his work at site, neat and tidy throughout the period of his work. All excess material/ spares/ consumables taken by Contractor, as well as the scrapped items and wooden logs/ crates/ planks shall be returned, from time to time, to the Stores, and transported/ unloaded by Contractor's personnel at the place shown by Order Manager/Engineer-in charge.

The Contractor shall so arrange that all the scrap generated during the progress of his work, is separated into two categories, viz.

- i) Saleable scrap like steel, copper or other metals, etc., and,
- ii) Others, which have nil or negligible resale value, like insulation material, jute, debris, etc. (or as directed by the Order Manager/Engineer-in charge).

The saleable scrap shall be shifted to and unloaded at a central place as per directions of the Stores-in charge, while the other scraps shall be shifted to other locations as per directions from Order Manager/Engineer-in Charge, or as per terms of the order.

The Contractor shall arrange to remove the scrap on regular basis, or even on daily basis, depending upon the requirement, to keep the area around his workplace neat and tidy. In case, it is observed that the

Contractor is not carrying out regular cleaning of his areas of work, or, is not returning the excess materials/ scrap, etc., to the Stores, Owner reserves the right to arrange the same through other sources, and back-charge the Contractor the cost of doing so, along-with overheads, by deducting the amount from Contractor's bills.

Contractor's final bill will be cleared by Owner only after confirming that proper clearing of his areas of work has been completed by the Contractor, and same is certified by the Order Manager/ Engineer in-charge

33. Tata Code of Conduct

The Owner abides by the Tata Code of Conduct in all its dealing with stake holders and the same shall be binding on the Owner and the Contractor for dealings under this Order/ Contract. A copy of the Tata Code of Conduct is available at our website: <http://www.tatapower.com/aboutus/code-of-conduct.aspx>. The Contractor is requested to bring any concerns regarding this to the notice of our Chief Ethics Officer on the e-mail ID: cecounsellor@tatapower.com.

34. Responsible Supply Chain Management:

The Owner is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy. The Contractor is required to comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations. The Owner encourages its Vendors/ Contractors/ Business partners to pay more attention to green design, green supply, green production, green logistics and green packaging in performing their business obligations.

The Contractor is required to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy.

A copy of the Responsible Supply Chain Policy along with Environment policy, Energy Conservation policy, Sustainability policy, Health & Safety policy and Human Rights policy is available at website: <http://www.tatapower.com/sustainability/policies.aspx>.

Contractor/Bidder is required to completely fill the attached "Supplier Sustainability Questionnaire" in support of their Green Supply Chain Management initiatives and submit the same with their offer.

The Owner recognizes that diversity in the workplace positively impacts business. The Owner is committed to help people from SC/ST background either by helping them to become entrepreneurs or by engaging workforce from SC/ST community under the contracts agreed herein. To encourage engaging SC/ST community, the owner may consider on the merit to incentivize the Contractor by paying additional 1% of

the service contract portion if the number of SC/ST workforce engaged in the contract exceeds 30% of the total deployed strength and 2%, if the strength goes beyond 50%. While the Contractor will assist the workforce so engaged to become self-reliant in meeting the work expectation, the Owner may also volunteer its training resources to the extent possible to improve their employability. The Contractor shall maintain the proper documentation of such category of the workforce engaged and the owner may consider to pay the incentive after its verification.

The Owner may also consider extending price preference of 5% in the bid evaluation for an order value up to Rs.50 Lacs, provided the company is owned by a person from SC/ST community having minimum 50% holding in the company.

such Material(s) regardless of when the Material(s) are shipped, received or accepted not shall any purported oral modification or revisions of the Contract by Owner or its representative(s) act as waiver of the terms hereof.

35. Vendor rating:

You are requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Your performance with respect to the said factors will be taken into consideration for future business.

36. Vendor Feedback:

34.1 In this dealing Vendors feedback is important for the purchaser to improve its processes. If Contractor have to report any grievance, problem or require any clarification, information, Contractor is requested to contact purchaser at email ID:

CC_CUSTOMERFEEDBACK@tatapower.com

34.2 Contractor is requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Contractor performance with respect to the said factors will be taken into consideration for future business.

37. Non-Waiver:

Failure of Owner or its representatives to insist upon adherence to any of the terms or conditions incorporated in the Contract or failure or delay to exercise any right or remedies herein or by law accruing, or failure to promptly notify the Contractor in the event of breach or the acceptance of or the payment of any Material(s) hereunder or approval of any design or Material(s) shall not release the Contractor and shall not be deemed a waiver of any right of Owner to insist upon the strict performance thereof or of any of its rights or remedies as to any

ESG FRAMEWORK FOR BUSINESS ASSOCIATES

Tata Power's Sustainability philosophy sits at the core of its Business Strategy. Tata Power Sustainability Model has an overarching objective of 'Leadership with care' with key elements of 'Care for the Environment'; 'Care for the Community'; 'Care for our Customers / Partners' and 'Care for our People'. These sustainability objectives encompass the Environmental, Social and Governance objectives driven as integrated elements.

Tata Power, together with its stakeholders is determined to achieve sustainable growth while creating shared value for all.

As a part of future ready roadmap, Tata Power has targeted following as our Environment, Social and Governance priorities:

- Being Carbon Net Zero before 2045
- Growing Clean capacity (80% by 2030)
- Customer centricity
- Becoming water neutral before 2030
- Achieving zero waste to landfill before 2030
- No net loss of biodiversity before 2030
- Positively impacting 80 million lives by 2027

In order to create a sustainable business ecosystem, Tata Power expects that all its Business Associates (BA) which includes its suppliers, vendors, consultants and service providers to align to its ESG and sustainability commitments.

Tata Power encourages improved efficiencies and scaling up of green initiatives through technology and innovation taking us farther on the journey of reducing carbon emissions and preparing the entire eco-system towards products and services that would have net positive impact on the environment and communities that we operate in.

The Vendors/ bidders wishing to associate with Tata Power are expected to share their own sustainability and ESG journey. We at Tata Power promote all Business Associates to have a sustainable procurement policy for their supplier and service providers to contribute to our integrated approach in achieving a sustainable supply chain. The BA is encouraged to carry out the assessment of their sub-contractors and sub-vendors on sustainability readiness so that they are aware of the expectation/ business requirement.

The Vendor/ Bidder shall fill-in the 'Environment, Social and Governance Compliance Screening Questionnaire for Business Associates' attached at Annexure-I and submit the same along with the Bid in Ariba online platform.

Responsible Supply Chain Management:

Tata Power is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy.

Tata Power Business Associate (BA) shall comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations.

Tata Power encourages its BA to focus on green design, green supply, green production, green logistics and green packaging in performing their business obligations. The BA is expected to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy (enclosed with this document as Annexure-II).

The BA is expected to:

- Strive towards Conservation of Energy, Water, Resources and optimize transportation of Men & Materials to minimize environmental impact and reduce carbon footprint.
- Carry out the assessment of materials used for construction, operation & maintenance, consumables and accordingly phase out those materials which are environmentally hazardous.
- Be cognizant that diversity in the workplace positively impacts business.
- Promote affirmative action by supporting people from SC/ ST background by engaging workforce from SC/ ST community under the contracts agreed herein.
- Share the commitment of 'No child labour', 'No forced labour', Non-discrimination on the basis of caste, colour, religion, gender, disability, maternity or pregnancy or any other factor unrelated to the requirements of the job
- Pay the wages or remuneration to the workforce, personnel deployed in compliance to all applicable laws and regulations.
- Provide its employees/ deployed labor with an employment environment that is free of physical or psychological harassment.
- Carry out the assessment of their Sub-contractors on their Sustainability Readiness so that they are aware of the above expectation/ standards
- To ensure usage of suitable package material which is more environmentally sustainable. Further the packing material shall be recycled to the extent possible. The material used for packing is expected to suit the mode of transport and to ensure its safe receipt at point of delivery.

Waste Disposal:

The BA is expected to follow best practices for disposal of waste, few of which are listed below:

- Have a detailed project plan that includes the waste management, segregation of all designated waste material (Recyclable/ Non-Recyclable), collecting, storing, disposing and transferring the same to pre-arranged facility/ destination in timely and safe manner as per environmental legislations. The project plan shall also include the innovative construction practice to eliminate or minimize waste, protect surface/ground water, control dust and other emissions to air and control noise.
- Have purchase policy to encourage the procurement of material with recycled and minimum packaging of goods during delivery and appropriate means for site-to-site transportation of materials to avoid damage and litter generation.
- Ensure that the residents living near the site are kept informed about proposed working schedule and timings/ duration of any abnormal noise full activity that is likely to happen.
- Ensure the regular maintenance and monitoring of vehicles and equipment for efficient fuel use so that emissions and noise are within acceptable limits to avoid air pollution.

Water Management:

The BA is expected to follow best practices for water management, few of which include a management and monitoring system for water withdrawals and consumption, procedures to reduce water usage or reuse/recycle water, and pretreatment of wastewater before disposal.

Compliance to Law:

The BA shall adhere to responsible business practices and comply with the provision of all the Statutory Acts Applicable. Special attention of the BA is drawn towards the compliance of provision of the following statutes: (along with the latest amendments/additions, as applicable):

- The Child Labour (Prohibition and Regulation) ACT, 1986.
- The Contract Labour (Regulation and Abolition) ACT, 1970.
- The Employee's Pension Scheme, 1995.
- The Employee's Provident Funds and miscellaneous provisions Act, 1952.
- The Employees State Insurance Act, 1948.
- The Equal Remuneration Act, 1976.
- The Industrial Disputes Act, 1947.
- The Maternity Benefit Act, 1961.
- The Minimum Wages Act, 1948.
- The Payment of Bonus Act, 1965
- The Payment of Gratuity Act, 1972.
- The Payment of Wages Act, 1936.
- The Shops & Establishment Act, 1954.
- The Workmen's Compensation Act, 1923.
- The Employer's Liability Act, 1938.
- and any other applicable statutory act

Social Accountability (SA 8000):

Tata Power expects its BAs to follow guidelines of SA 8000:2014 on the following aspects

- Child Labour
- Forced or Compulsory Labour
- Health & Safety
- Freedom of Association & Right to Collective Bargaining
- Discrimination
- Disciplinary Practices
- Working Hours
- Remuneration
- Management System

Health and Safety

The BA is expected to ensure the health and safety of his and his Sub-contractor's staff and labour. The BA shall, in collaboration with and according to the requirements of the local health authorities, ensure that medical staff, first aid facilities, sick bay and ambulance service are available at the accommodation and on the Site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The BA shall maintain records and make reports concerning health, safety and welfare of persons deployed, and damage to property, as the Owner's Representative may reasonably require. The BA shall be responsible for the medical treatment / hospitalization of his and his Sub-contractor's staff/ labour.

The BA shall appoint a qualified Safety officer at the Site to be responsible for maintaining the safety, and protection against accidents, of all personnel on the Site. Such Safety officer shall have the authority to issue instructions and take protective measures to prevent accidents.

The BA shall comply in toto with the Tata Power's Contractor Safety Terms & Conditions, Health Safety & Environment Manual while working on Tata Power Site/ Services/ Contracts.

Grievance Mechanism

The BA is expected to have grievance procedures that allow stakeholders to anonymously bring environmental and/or work-related violations and/or concerns to the attention of management. In addition, the BA is expected to have procedures for examining reports of environmental and/or work-related violations or concerns and/or privacy complaints.

Data Protection

The BA is expected to have a formal process to address data security or privacy issues.

ANNEXURE-I



Sr. No.	Question Description	Response (Y/N)	Remarks
Organization			
1	Does your Company have Sustainability Policy at Organization Level? If Yes, Please attach		
2	Do you have sustainable procurement policy in place for your own suppliers? If Yes, Please attach		
3	Does your company do regular assessment of its suppliers on ESG parameters?		
4	Are there ESG risks, or negative impacts identified in your supply chain		
Governance			
1	Is diversity taken into consideration when appointing board members/ senior management? Do you have an independent director/s?		
2	Has your company taken initiatives to ensure ethical practices at workplace? Please share the details, Policies etc.		
3	Does your company have a formal process to address data security or privacy issues? Please share the details, Policies etc.		
4	Does your company have grievance mechanism for stakeholder issues and track resolution?		
Environment/ Planet			
1	Does your company have Environmental Policy? If Yes, Please attach		
2	Do you have a formal process for waste management including solid wastes, liquid wastes and hazardous waste?		
3	Does your company track greenhouse gas emission? Also, what percentage of own consumption comes from the renewable energy?		
4	Does your company have a formal process for water management including monitoring of water consumption and withdrawals, and if applicable, pretreatment of wastewater?		
Green Technology/ Innovation			
1	Are your facility/ Product/ Services provided by you is based on green design, green production, green packaging or green logistics considerations? Please elaborate.		
2	Do your products or services have any environmental or social features or benefits (e.g. environmental/energy certification, ecolabels, fair trade certification, etc.)?		
Social/ People			
1	Does you facility/ Company have written personnel policies in place Are you an equal opportunity employer?		
2	Please describe any formal programme / campaign in place to promote company involvement with the community (volunteering, etc.). What is the percentage of profit spend on community activities?		
3	Does your company have a written Health & Safety Policy or Program? If Yes, Please attach		
Certifications: Does your company have following certifications (valid till date-please mention validity)			
1	ISO9001 accreditation		
2	SA8000 or equivalent		
3	ISO 14001 certification		
4	ISO 18001/45001 or equivalent		
5	ISO/IEC 27001 or equivalent		
6	Any Other (Please specify)		

Signature

Business Associate Name

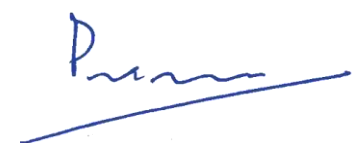
ANNEXURE-II

CORPORATE SUSTAINABILITY POLICY

At Tata Power, our Sustainability Policy integrates economic progress, social responsibility and environmental concerns with the objective of improving quality of life. We believe in integrating our business values and operations to meet the expectations of our customers, employees, partners, investors, communities and public at large

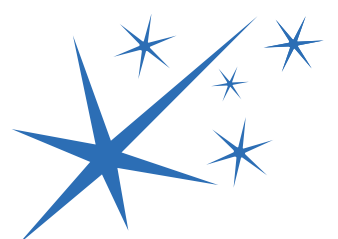
- We will uphold the values of honesty, partnership and fairness in our relationship with stakeholders
- We shall provide and maintain a clean, healthy and safe working environment for employees, customers, partners and the community
- We will strive to consistently enhance our value proposition to the customers and adhere to our promised standards of service delivery
- We will respect the universal declaration of human rights, International Labour Organization's fundamental conventions on core labour standards and operate as an equal opportunities employer
- We shall encourage and support our partners to adopt responsible business policies, Business Ethics and our Code of Conduct Standards
- We will continue to serve our communities:
 - By implementing sustainable Community Development Programmes including through public/private partnerships in and around our area of operations
 - By constantly protecting ecology, maintaining and renewing bio-diversity and wherever necessary conserving and protecting wild life, particularly endangered species
 - By encouraging our employees to serve communities by volunteering and by sharing their skills and expertise
 - By striving to deploy sustainable technologies and processes in all our operations and use scarce natural resources efficiently in our facilities
 - We will also help communities that are affected by natural calamities or untoward incidence, or that are physically challenged in line with the Tata Group's efforts

The management will commit all the necessary resources required to meet the goals of Corporate Sustainability.



(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018



Supplier Code of Conduct

Tata Power follows the Tata Code of Conduct (TCoC) and the Whistle blower Policy and expect all its Suppliers to adhere to the same principles. “**Supplier**” here means any business, company, corporation, person or other entity that provides, sells or seeks to sell, any kind of goods or services to Tata Power, including the Supplier’s employees, agents and other representatives.

Tata Code of Conduct- (TCoC): <https://www.tatapower.com/pdf/aboutus/Tata-Code-of-Conduct.pdf>

Whistle Blower Policy: <https://www.tatapower.com/pdf/aboutus/whistle-blower-policy-and-vigil-mechanism.pdf>

Anti-Bribery & Anti-Corruption Policy: <https://www.tatapower.com/pdf/aboutus/abac-policy.pdf>

The suppliers are expected to adhere to the following Do’s and Don’ts:

Do’s

1. The Suppliers shall be committed to supplying products and services of high quality that meet all applicable standards and laws, including product packaging, labelling and after-sales service obligations.
2. Comply with all applicable laws and regulations, both in letter and in spirit, in all the territories in which it operates.
3. Strive to provide a safe, healthy and clean working environment for its employees.
4. Strive for environmental sustainability, particularly with regard to the emission of greenhouse gases, consumption of water and energy and the management of waste and hazardous materials.
5. The Supplier shall represent our company (including Tata brand) only with duly authorised written permission from our company.
6. Safeguard the confidentiality on the use of intellectual property, information and data of the Company.
7. Gifts and hospitality given or received should be modest in value and appropriate as per Company Policy.
8. The assets of Tata Power shall be employed primarily and judiciously for the purpose of conducting the business for which they are duly authorised.
9. All actual or potential conflicts due to financial or any other relationship with a Tata Power employee shall be disclosed.

Don’ts

1. The Supplier shall not make unfair or misleading statements about the products and services of competitors.
2. Children shall not be employed at workplaces.
3. Forced labour shall not be used in any form.
4. The Suppliers shall neither receive nor offer or make, directly or indirectly, any illegal payments, remunerations, gifts, donations or comparable benefits that are intended, or perceived, to obtain uncompetitive favours for the conduct of its business with Tata Power.

Reporting Violations

The Supplier shall notify the Company regarding any known or suspected improper behaviour of other suppliers or employees relating to its dealings with Tata Power, by email to: cecounsellor@tatapower.com. The same can also be raised through our 3rd party ethics helpline facility:

Toll-free Number	1800 267 4065
Email	tatapower@tip-offs.in
Website & Chatbot	www.tatapower.tip-offs.in
Postal address	Attn to: Mr. Puneet Arora, Deloitte Touch Tohatsu India LLP, 6 floor, AIPL Business, Sector 62, Gurugram, Haryana 122102

CYBERSECURITY COMPLIANCE

The Vendor unconditionally undertakes, for the entirety of the contract term and the warranty / support period, to comply with the cybersecurity obligations set out below. Acceptance of this clause is a condition precedent to award; non-compliance constitutes a material breach.

1. Universal Obligations — applicable to all Vendors and all supplies

- (a)** ISO/IEC 27001:2022 certification covering the supply scope is maintained current; where the supply includes vendor develop software, firmware, or a vendor operated software solution, an independent third-party VAPT of the offered solution has been conducted within the last 12 months (this VAPT requirement does not apply to distributors reselling OEM hardware such as laptops, switches, routers, and similar IT/OT and networking equipment's).
- (b)** No private Wi-Fi, personal hotspots, 4G/5G modems, unmanaged switches, or unauthorised broadband shall be deployed at Tata Power sites. All remote access shall be conducted exclusively through Tata Power's approved Secure Remote Access (SRA) solution and processes defined.
- (c)** MFA is enforced for privileged and remote access; integration with enterprise IAM (SAML 2.0 / AD / LDAP) is supported; RBAC under least privilege is applied; dedicated named accounts are used (no shared Vendor credentials); hardcoded or default credentials are prohibited in production; data is encrypted at rest using AES-256 (or equivalent) and in transit using TLS 1.2 or higher, with SSL / TLS 1.0 / 1.1 disabled.
- (d)** All operational, configuration, and diagnostic data remains the sole property of Tata Power; the supplied solution contains no hidden telemetry, backdoors, undisclosed data collection, or background cloud synchronisation.
- (e)** For IT solutions and applications, security patches shall be provided within: Critical (CVSS $\geq$ 9.0) 15 days; High (7.0–8.9) 30 days; Medium (4.0–6.9) 60 days; Low ($<$ 4.0) 90 days. For OT solutions, security patches for vulnerabilities with a CVSS score above 8.0 shall be provided to Tata Power as and when released by the OEM / Vendor, after due testing in a representative environment to prevent operational instability. Zero-Day interim mitigation is issued within 24–48 hours of internal discovery. Not less than 12 months' written notice of any EOL / EOS milestone shall be given.
- (f)** Tata Power shall be notified of any confirmed or suspected security breach within 4 hours of discovery, with full cooperation for CERT-In's 6-hour mandate.

2. Conditional Obligations — applicable where the supply category applies

- (a)** IT Software / Firmware (where the supply includes Vendor-developed software or firmware): A documented SSDLC with SAST, DAST, and SCA gates is operated; a machine-readable SBOM is delivered identifying all components, versions, licences, and known CVEs at delivery.

- (b) IT Hardware & Endpoints** (servers, workstations, laptops, network equipment): EDR / AV with 3 years of free updates is bundled, or formal compatibility with Tata Power's chosen EDR / AV with central manager is declared; Windows endpoints are hardened to CIS Benchmark Level 1; BIOS / UEFI password protection is enabled; boot-from-external-media is disabled; USB ports are lockable; unused ports, services, and default accounts are disabled and documented; shipments arrive in tamper-evident packaging.
- (c) Operational Technology / ICS** (PLCs, RTUs, IEDs, SCADA, EMS, DCS, HMIs, OT firewalls, MES, SIS, engineering workstations and OT endpoints/computers): IEC 62443-4-1 and 4-2 compliance is held or independently assessed; architecture aligns with the Purdue Model with a Communication Matrix; MES-to-OT exchanges traverse approved OT firewalls (no direct IT-to-Level 1 / 2 connectivity); Secure Boot with cryptographic firmware validation; offline patching via removable media or local update server (no internet dependency); SIS is physically and logically segregated from BPCS (no shared credentials, networks, or power); secure industrial protocols supported (DNP3 SAv5, IEC 61850 with TLS, OPC-UA SignAndEncrypt) — Telnet, FTP, SNMP v1 / v2c, unencrypted HTTP, rsh, rlogin are not used on any OT segment; application whitelisting enabled on HMIs by default; all OT project files (PLC / DCS / RTU programs, HMI projects, SCADA exports, IEC 61850 SCL / CID / SCD files, network device configs, SIS files) are delivered in native and vendor-agnostic formats at handover and refreshed after every configuration change. Cybersecurity compliance during FAT and SAT is a condition of acceptance; non-conformance entitles Tata Power to reject equipment without commercial impact, with any re-FAT / re-SAT at Vendor's cost.
- (d) Cloud / SaaS** (solutions hosted outside Tata Power's infrastructure): A current SOC 2 Type II report or ISO 27017 / 27018 certification covers the offered service; all data processing, storage, and transmission occurs exclusively within India unless explicitly approved in writing by the Tata Power CISO and Legal teams.
- (e) Personal Data Processing** (any solution processing personal data on behalf of Tata Power, regardless of hosting model): The Digital Personal Data Protection Act, 2023 is complied with; a Data Processing Agreement defining data categories, retention, deletion, sub-processor disclosure, and the Vendor's processor role shall be executed prior to go-live.

3. Remedies, Indemnity, and Survival

- (a)** Any false, misleading, or materially incomplete declaration, or any material non-compliance with this clause, shall entitle Tata Power to: (i) disqualify the bid; (ii) terminate any awarded contract for material breach; (iii) forfeit bid security and performance guarantees; (iv) blacklist the Vendor for a period determined by Tata Power; and (v) pursue such other legal recourse, civil or criminal, as may be available.
- (b)** The Vendor shall indemnify Tata Power against losses, penalties, damages, regulatory fines, and reasonable legal costs arising from a security breach attributable to the Vendor's negligence or non-compliance with this clause.
- (c)** Sub-clauses 1(d), 1(f), 2(d), and 2(e) shall survive expiry or termination of the contract for the period during which Tata Power data remains in the Vendor's custody, or any obligation remains capable of giving rise to a cause of action, whichever is longer.

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Appendix 2:

Safety Terms and Conditions

Reason for Change	Date of Last Revision	Prepared By	Reviewed By	Approved by
Periodic Revision and Inclusion of Procedures and formats from BASCC.	<u>1 Aug 2023</u> <u>(Rev 5)</u>	All Discom and CFT members	Corporate Safety Team	Suresh H Khetwani (Chief safety and Environment)

Corporate Safety Team.

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1.0 Objective:

The Objective of Safety Terms and Conditions is to apprise the Business Associates about various expectations from the BA to implement Tata Power Health & Safety Management System without fail.

2.0 Scope:

This procedure applies to all operating and project sites of The Tata Power Company Ltd and Group companies including new businesses like Electric Vehicle charging, Home Automation, Microgrid, Roof top solar etc. This Code of Conduct also applies to all operating and project sites of four Odisha Discoms and New business based on mutually agreed timeline for implementation.

3.0 Safety Organization & Responsibilities

3.1 Business Associate Site Management and Supervision

Each Business Associate will be responsible for fulfilling all statutory and safety requirements as per the laws of the land and not limited to Factory Act, Electricity Act, Electricity Rules and Regulations, Shop and Establishment Act etc.

Each Business Associate shall provide at least one competent full-time safety supervisor for workforce of every 50 workers or less than that. When workforce ranges to 500, the Business Associate must provide at least one qualified safety officer (This may be subjected to change as per applicable act). Thus, for work force of 500 workers there will be one qualified safety officer and 10 safety supervisors. For every 500 additions in workforce, the Business Associate must add 1 safety officer and 10 safety supervisors. The Order Manager or Safety Department of the Tata Power Division /Discoms will review and approve the appointment of all safety officers and supervisors. The safety supervisors/officers will work with the guidance from Tata Power Division /Discoms Safety Department and align themselves with Tata power Division/Discom safety requirements.

For O&M related AMC activities, minimum one qualified safety officer to be deployed for each Division of the Discoms.

(For any specific & specialized work, site safety supervisor will be decided by SCG)(R6)

Qualified safety officer means he or she has completed PDIS or ADIS from a recognized institute.

Site Safety Officer/Safety Supervisor / Safety Coordinator shall be interviewed by the Order Manager/ Safety head of the Tata Power Division/Discom and then gate passes shall be issued if the interview is successful.

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Site Manager of Business Associate /Sub Vendor is responsible, and will be held accountable, for the safety of their own workforce as well as that of sub-Business Associate s. He should also ensure that all equipment, materials, tools, and procedures remain in safety compliance at job site.

Responsibility of Site manager includes, but not limited to:

- 3.1.1 Holding officer/supervisors accountable for safety and actively promote safe work performance.
- 3.1.2 Participate in and cooperate with all safety program requirements to be implemented to meet Tata Power Division /Discoms safety objectives
- 3.1.3 Ensure timely reporting of safety incidents, near misses, unsafe acts, and conditions.
- 3.1.4 Identify the training needs of BA employees and maintain all safety training documents.
- 3.1.5 Provide Safety Performance Report at an agreed frequency.
- 3.1.6 Stopping of unsafe work (Acts and/or Conditions) immediately. Work to start only after corrective actions are implemented.
- 3.1.7 Ensure and participate in daily toolbox talk for all the jobs.
- 3.1.8 Ensure that only tested and certified tools and equipment are issued to the workers and being used at the site.

3.2 Business Associate Supervisors and General Staff.

Business Associate s' site supervisors and general staff members in charge of job site functions such as field engineering, warehousing, purchasing, costing, and scheduling etc. are responsible for the safe performance of the work of those they supervise. They must set an example for their fellow employees by being familiar with applicable sections of the Site Safety program and ensuring that all site activities are performed with SAFETY as the primary objective.

Each site supervisor is responsible and will be held accountable for identifying, analyzing, and eliminating or controlling all hazards through implementation of an aggressive, pro-active Health, Safety and Environmental Program. Each supervisor will proactively participate in the Safety program by observing, correcting, and recording unsafe acts and conditions at plant / sites.

The BA's supervisor is the link between Tata Power Management and the BA (including his employees). (R6)

- He coordinates the work of his company's employee on site and is responsible & accountable for the safety of BA workforce. He will collaborate with site safety supervisor (SSS). BA's supervisor shall review the Safety requirements with his employees prior to the beginning of each job. Documentation of this review shall be forwarded by him to the Order Manager.(R6)

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- Assigning jobs to his workers, inspection of tools, equipment & PPEs , reporting of incidents & near-misses, housekeeping of work area and carrying out Safety Audits.(R6)
- Deployment of all applicable Safety standards & procedure as mention in Safety Term& Condition CSMF2 during execution of the jobs.(R6)
- Ensuring job specific training prior to execution of the job.(R6)
- Conducting Tool - box meeting and compliance of SOP & statutory requirements at work place, correction of all unsafe conditions and acts.(R6)
- BA'S Supervisor will deeply involve in making JSA through participation of work force.(R6)
- BA's Supervisor will invite all BA employees for participation & engagement daily ensuring 100% in either observation reporting, TBT, Mass Meeting and discussion for Risk Assessment & implementation of control measure.(R6)

3.3 BA Site Safety Supervisor (SSS)(R6):

- 3.3.1 SSS will carry out daily safety audit and inspections of tools, tackles, equipment and PPEs. They will identify and help in correcting the unsafe acts and unsafe conditions created while executing job t site with the help of BA's supervisors (R6).
- 3.3.2 SSS will ensure his participations in TBT and Mass Meetings regularly. They will also ensure reporting of all incidents & near-misses and participate in incident investigation (R6).
- 3.3.3 SSS will help in risk assessment of activities while developing SOP for the job (R6).
- 3.3.4 SSS will deeply involve in making JSA through participation of work force.(R6)
- 3.3.5 SSS will assist for participation & engagement of 100% BA employees daily in either observation reporting, TBT, Mass Meeting and discussion for Risk Assessment & implementation of control measure.(R6)

3.4 Business Associate Workforce

- 3.4.1 Business Associate shall provide adequate quality and quantity of manpower as mutually agreed. Generally, for each 10-15 workforce one supervisor is suggested. For all high risk jobs there shall be one Business Associates supervisor shall be deployed.(R6).
- 3.4.2 All the Business Associate employees shall attend "SHE L0(Other than new business and Odisha Discom)/L1 Foundation Course in Safety". Depending on the critical procedure in job employees shall also be required to attend "SHE L2 course of critical/high risk operations". All Supervisors shall be required to attend "SHE L3 Supervisory Training". All the above trainings will be conducted by TPSDI/Skill development

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institute of Disco, or other equivalent institute approved by Tata Power.

- 3.4.3 Business Associate employees shall be required to attend any other additional training if suggested by Order manager or Site Safety Head. The cost of such additional training shall be borne by the Vendor.
- 3.4.4 Business Associate / Vendor shall mobilize their manpower well in advance to complete the training through TPSDI/Sill development Institute.
- 3.4.5 The Vendor / BA shall arrange or bear the conveyance and food expenses incurred during training of BA employees in Odisha Discom.
- 3.4.6 The validity of the training L1, L2 and L3 is 3 years. There will be competency assessment as Revalidation test in every three months for Tata Power Division and six months for Odisha Discom till one year from implementation of BASCC. Those who fail in the competency assessment shall undergo training again.
- 3.4.7 Supervisors/Welder/Electricians/Line man /Fitters /Radiographers/Riggers engaged by the Business Associate shall have valid competency certificates issued by authorized agency/Institute.
- 3.4.8 Business Associate workforce must make safety a part of their job by following safety rules and regulations and by using all safeguards and safety equipment. They must take an active part in the Safety programs for the Site.
- 3.4.9 Every member of the workforce is expected to report for work without influence of any Drug/Alcohol. Failure to comply with this requirement shall result in immediate termination of employees under the influence of drug and alcohol plus show cause notice/penalty to the vendor.
- 3.4.10 All employees shall report hazardous conditions, practices and behaviours in their work areas and correct wherever possible.
- 3.4.11 Workforce is responsible for active participation in safety and health programs, suggestion systems, trainings and reporting of unsafe act/practices, Unsafe conditions incidents and injuries to their supervisors.

3.5 Business Associate (Vendor) /sub-Vendor

- 3.5.1 Vendors/Business Associate shall always comply with and ensure that their workforce comply with all site safety rules and regulations. Specifically, with applicable provisions of the Site Safety Management Plan and all statutory safety rules and regulations.
- 3.5.2 After receiving the work order/ purchase order vendor/Business Associate /bidder shall not appoint Sub-Business Associate without safety assessment of the sub-Business Associate through safety concurrence group Under Business Associate Safety Code of Conduct. Penalty of 5% of contract value will be applicable to the Business Associate if sub-Vendor is appointed without the permission of SCG and without evaluation through BASCC process.

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- 3.5.3 For engaging any sub-Vendor, the Prime Vendor as well as the sub-Vendor should be individually registered with Tata Power. Sub-contracting or hiring of others, by the BA to perform the services is subjected to specific, prior approval by the CA/OM. Such approval shall depend upon compliance with the following minimum requirements (R6):-
- i. Sub-vendors identified by the Prime vendor will be subject to the same Safety Potential Evaluation Criteria as the Prime vendor for all Medium-risk/High-risk job where supervision will be done by the sub- vendors. In such cases, vendors must have a Star-rating of 4 or above, for becoming a sub- vendor(R6).
 - ii. The SCG team shall evaluate the Safety and technical competency of the sub-contractors for High risk job(R6)
 - iii. The Departmental Head will have the authority to approve any sub-contracting process based on requirement as submitted by the Prime Vendor (See CSM F-14 Sub-Vendor Engagement Request Form).
 - iv. No Safety potential evaluation shall be conducted for sub-letting of Low risk work(R6).
 - v. The Prime vendor shall be fully liable and responsible to Tata Power for the acts, errors, and omissions of its sub-vendors and shall be relieved neither of any obligation to Tata Power under the contract, nor of any other legal requirements(R6).
 - vi. The Prime vendor shall use only sub-vendors of demonstrated experience and reliability regarding the services to be provided(R6).
 - vii. The Sub-vendor shall agree in writing to be bound by all obligations of the Prime vendor set forth in the Contract.(R6)
 - viii. Safety performance evaluation shall be done for both prime vendor & sub-vendor.(R6)

Types of Sub-contracts and Associated Requirements (R6):

- I. Sub - Vendor working with his own supervision:- Sub-vendors must achieve a minimum Star-rating of 3 for performing High risk jobs under Tata Power supervision or under the Principal/Main Vendor (Prime Vendor).(R6)
- II. Sub-vendor working under Prime vendor's supervision (as supplier of manpower):- Manpower-supply contracts have to be supervised by the Prime vendor and the Prime vendor's Star- rating has to be taken into consideration. Vendors supplying manpower need not qualify in the Star-rating assessment.(R6)
- III. 3. Only one level of sub-contracting is allowed, and the use of any sub-vendors must be authorised by Tata Power before any contract is finalised. Sub-vendors shall be subject to the same registration and selection/screening processes, as well as the same Safety performance requirements as those required of all Tata Power vendor's. Sub- vendor details are to be attached to the main contract during the RFQ stage. The process of sub-contracting is to be approved by the Chief / Head of the department (BASCC - Appendix#14).(R6)

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4.0 Procedure (R6).

4.1 Registration of Business Associates (Vendors):

For Vendor Registration, Contract Department will issue following documents for evaluation of Business Associate's safety capability.

- 1) **CSM F2 Safety Terms and Conditions (R6):** The document **CSM F2 Safety Terms and Conditions** provides the information about Tata Power-Division /Odisha Discom safety System to the Business Associate
- 2) **CSM F3 Safety Category Qualification Form(R6):** Business Associate will submit the **CSM F3 Safety Category Qualification Form** with all relevant details and documents to Vendor Registration Initiator, which will in turn forward it to Safety Concurrence Group (SCG) for evaluation.

CSM F3 (R6): - Safety Category Qualification form

1. "Safety Category Qualification Form" is part of vendor registration form. It needs to be filled by the Business Associate at the time of Registration and should be submitted to Requester / Order Manager with all relevant documents.
2. The same will be evaluated by Safety Concurrence Group of the Division (SCG).
3. Information provided by Business Associate will be verified during site visit.

Safety Category Qualification Form

Please consider my application for

Category A Vendor: Vendor eligible to carry out Very High- and High-risk O&M/Project jobs

Category B Vendor: Vendors eligible to carry out technical jobs, classified as Medium /~~low~~ risk

Category C Vendor: Vendors eligible for to carry out low or very low risk administrative and office job

Category D vendor: All Consultants, Medical Practitioners or vendors taking job from Tata Power and working from their own premises.

Name of the Vendor:			
Sr. No	Safety Information	Yes / No	Remarks
1	Certified for i. ISO 45001, ii. ISO: 14001 iii. ISO: 9001	i. Y/ N ii. Y/ N iii. Y/ N	If Yes, Attach copy of the certification. If No, mention plan to get the certification.

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Name of the Vendor:							
	(ISO certificates to be issued from reputed accreditation agencies specified by Tata Power)						
2	Safety Statistics for current and Last Three (3) Years - LTIFR - LTISR	Yes/No		Current Year	Year 1(Last FY)	Year 2	Year 3
			LTIFR				
			LTISR				
3	Any Compensation paid due to accidents during current and last three years?	Yes/No		Amount (INR)	Manhour		
			Current Year				
			Y1 (Last FY)				
			Y2				
			Y3				
4	Any prosecution against you by statutory bodies/clients during last three years due to statutory violations, criminal negligence towards safety and dereliction of duty of care towards your employees? Is any case still pending against you?	Yes/No	If yes, give details. If no, give an undertaking that no case is pending against you and you have not been prosecuted by statutory bodies or clients.				
5	Do you have Safety Policy? Safety Principles? And Lifesaving Rules?	Yes/No	If yes, attach copy of the documents available.				

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Name of the Vendor:			
6	Do you have Safety training process?	Yes/No	If yes, attach safety training process and average training manhour of your employees for the last three years.
7	Do you have a system for recording, reporting, and investigating all incidents or near misses?	Yes / No	If yes, show the incident statistics of last three years and implementation of CAPA.
8	Do you have a disciplinary action program against your employees for violation towards safety rules and procedures?	Yes/No	If yes, show the records of disciplinary action taken the last three years.
9	Do you have a reward and recognition scheme for your employees who show exemplary safe behavior and contribute to overall safety improvement at site?	Yes/No	If yes, show the records of Reward and Recognition given during the last three years.
10	Do you engage in safety promotional activities?	Yes/No	If Yes, Show the proof of engagement in safety promotional activities.
11	Have you been recognized or awarded or rewarded by government bodies of clients for showing excellence in safety management in your jobs during last three years?	Yes / No	If Yes, Show proof.
12	Do you provide adequate quality of PPEs to your workmen?	Yes/No	If yes, please provide details of PPE Matrix and if required, samples for inspection.
13	Do you have Safety organization structure e.g., Safety Officers and Safety Committees?	Yes/No	If yes, attach copy of the safety organization structure, details of safety committees and safety professionals.

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Name of the Vendor:			
14	Name and address of sites where work is in progress or worked earlier	Yes/No	Site details to be attached for inspection by Tata Power-Division /DISCOM Officials.

Note: If you respond NO to any of the above questions, you can mention your plan to get the required documents.

I hereby confirm that the information provided above are true. I give my consent to be penalized as deemed fit in case any information given above are found to be false.

I will abide the general safety guidelines mentioned in the purchase order / work order and will ensure to prepare and follow site specific safe operating practices in consultation with the site-in-charge and safety professional. I will abide by penalty scheme in case of non-compliance.

Signature :

Name and Designation :

Stamp of Organization :

- 3) **CSM F4 Safety Potential Evaluation Criteria** : The SCG will evaluate the details submitted by the Business Associate based on a predetermined criteria **CSM F4 Safety Potential Evaluation Criteria along with Star Rating(R6)** for Vendor Registration and will determine the category (Category A/B/C/D) for which the Business Associate will be registered. As mentioned in the above criteria, a site visit may also be organized by SCG prior to registration under Category A and B. In case, the Business Associate does not qualify the safety criteria, the Business Associate will not be registered. However, he may apply afresh for registration after 6 months.

CSM F4 - Safety Potential Evaluation Criteria for Vendor Registration (For Information to BA-Not to submit by BA) R6

At the time of vendor registration, vendor will be registered under 4 categories

- 1) **Category A-** Vendors eligible to carry out High risk Jobs
- 2) **Category B-** Vendors eligible to carry out technical jobs that are Medium/~~low~~-risk
- 3) **Category C-** Vendors eligible to carry out administrative and office jobs
- 4) **Category D-** Outsourced Jobs / Consultants /Medical Practitioners / Suppliers etc

For vendors to be registered under **Category A/B**, a safety potential evaluation will be carried out based on following parameters. (Actual **score is safety capability score**)

Star rating criteria score: 5 Star- 90 to 100, 4 Star- 80 to 90, 3 Star- 70 to 80(R6)

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Sr No	Description	Weight age (%)	Actual Score
1	Does the service provider have a valid 45001 Certification?	10	
2	<u>Performance Measure: Lead Indicator</u> <u>(Ref to Safety Performance evaluation report CSM F11 (A) Lead indicator score)(R6)</u>	40	
3	<u>Performance Measure: Lag Indicator</u> <u>(Ref to Safety Performance evaluation report CSM F11 (B) Lag indicator score)(R6)</u>	20	
4	Has there been any prosecution / conviction for any Contravention regarding safety and Health provision under the factories Act/Electricity Act / BOCW Act and Rules framed there under? If yes Give Zero otherwise 5 Marks.	5	
5	Check the Safety orientation & training process of Service provider- Records of Safety training provided to safety officer/supervisor /workmen during last 1 year as percentage (%) of total employed by service provider ✓ Safety Officer: >80% of employees: 5 Marks, 50 to 79% of employee: 2.5 Marks and <50%: Zero. ✓ Safety supervisor: >80% of employees: 5 Marks, 50 to 79% of employee: 2.5 Marks and <50%: Zero. ✓ Workmen: >80% of employees: 10 Marks, 50 to 79% of employee: 5 Marks and <50%: Zero	20	
6	Check the organizational structure for safety professionals & engineers / supervisors. ✓ Check Availability of number of Safety Supervisor from government recognized institute as per workforce strength. 1 in 50 employees than 5 Marks <u>otherwise Zero.</u> (R6)	5	
	Total	100	

Evaluation Criteria for Category C

Sr no	Description	Weight age (%)	Actual Score
1	Does the Business Associate have a valid ISO 9001 certification?	40	
2	Check the Safety statistics of Service provider (If available than 10 otherwise Zero)	10	
3	Check the trend LTIFR/LTISR for last 3 years (If less than 0.2 than give 20 Marks if between 0.2 to 0.3 than give 10 marks and otherwise Zero	20	

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4	Has there been any prosecution / conviction for any Contravention regarding safety and Health provision under the factories Act/Electricity Act / BOCW Act and Rules framed there under? If yes Give Zero otherwise 10 Marks.	10	
5	Check the Safety orientation & training process of Service provider- Records of Safety training provided to safety officer/supervisor /workmen during last 1 year as percentage (%) of total employed by service provider ✓ Safety Officer: >80% of employees: 5 Marks, 50 to 79% of employee: 2.5 Marks and <50%: Zero. ✓ Safety supervisor: >80% of employees: 5 Marks, 50 to 79% of employee: 2.5 Marks and <50%: Zero. Workmen: >80% of employees: 10 Marks, 50 to 79% of employee: 5 Marks and <50%: Zero	20	
	Total	100	

Evaluation Criteria for Category D

Category D does not require any evaluation as it is for outsourced job outside the Tata Power company premise.

For vendor to be registered for any category, vendor's safety capability score should be $\geq 70\%$.

4.1.1 Star Rating(R6):

SCG will evaluate Star Rating as per following -

- Initially potential Star Rating based on CSM F4 Safety Potential Evaluation Criteria
- After 6 month actual star rating assessment to be carried out based on CSM F4 Safety Potential Evaluation Criteria and safety performance evaluation.
- Odisha Discom & New Business Star Rating process will be applicable only 1 year after implementation of it.
- Based on Safety capability score Vendors rating will be evaluated (For 3 star rated vendors - within 12 months from previous assessment date and for 4 & 5 Star rated vendors – within 24 months from previous assessment and Re-assessment within three months from previous assessment date when a vendor is unable to achieve Star rating 3)
- Category A - Vendor must require [Safety Star Rating 4](#) and above.
- Category B - Vendor must require [Safety Star Rating 3](#)

Star Rating will be evaluated by Third Party from FY 26

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4.2 Contract Preparation(R6).

Safety bid Evaluation will be done only for medium and high risk (R6). The RFQ will be attached with **CSM F2 Safety Terms and Conditions which includes following Documents**

- 1) **CSM F6 Safety Competency Assessment Form**
- 2) **CSM F8 PPE requirements**
- 3) **CSM F9 Site Safety Management Plan Job Specific Safety Requirement (Educational and Professional Qualification, Skill & Experience Manpower, Tools, and Tackles, e.g., man lifter, use of drone, use & availability of rescue kit, Work Methodology etc.)**

Safety bid evaluation will not be done for category C and D.

BA shall submit duly filled **CSM F6 Safety Competency Form** along with the bid. SCG will evaluate the document as per the **CSM F7 Safety bid evaluation criteria**. **Site Safety Management Plan CSM F9**, defining the complete procedure of executing the job at site will be signed by the Business Associate and SCG after mutual agreement. BA will attach a copy of Site Safety Management Plan along with PO to the successful bidder. Please refer **CSM F5 Process Flow Chart for issuing RFQ and PO** significant health and safety risk associated with it.

CSM F6 - Safety Competency Assessment Form (Template)

Name of the Vendor/Bidder:

Name of the Sub Vendor (If job is given to Sub Vendor):

Description of the Job:

Request for Quotation (RFQ) No.:

Vendor/Bidder to mandatorily provide the below safety competency related information:

1. Proposed Manpower Deployment Schedule :-

Type of manpower	Qualification	Experience	Month 1	Month 2	Month 3	
Project /<u>AMC</u> <u>Manager()</u>						
Site In Charge						
Safety Manager						
Safety Officer						
Supervisors						
Technicians						

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High Skilled workmen						
Skilled workmen						
Semiskilled workmen						
Lineman						
Helpers						
Drivers						
Unskilled						
<u>Others()</u>						

Instruction to Bidders:

- Indicate the overall site manpower deployment schedule as above
- Indicate direct or subcontracted employees by using color code given below:

Direct Bidder Employee – Green

Partly Direct / partly Subcontracted – Yellow

- 4.1.1 Subcontracted – Red** If subBusiness Associate detail is not available at stage of Bid evaluation, then this can be agreed with Order manager or Engineer in charge before deployment Ensure that all sub-Business Associate s follow the Tata Power Safety Procedure and agreed CSM F9 Site Safety Management Plan.

- Against each category, indicate minimum educational qualification and work experience
- Add rows to include other specialized manpower, if any.
- Extend columns to cover the entire duration of the proposed contract.
- If the operation is in shifts, then indicate shift in charge and / or safety officers required for each shift operation.

2. List of Tools, Tackles, Machines and Equipment: -

Bidder/ Vendor to provide the list of tools, tackles, equipment **to be used during the job / project execution**. Bidder/Vendor to ensure that all the lifting tools and tackles, pressure vessels are duly certified by the competent person authorised by the Chief Inspector of Factories of the respective state prior to start of the job

Sr. No	Description of Tools / Tackles	Capacity / Rating	Quantity	Make	Year of manufacture	Remarks
1						
2						
3						
4						
5						
.....						

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3. Safety Records:

Bidder to provide the details of fatalities and lost workday cases (LWDC), occurred in last three years (data to be provided for the last completed FY and preceding 2 years).

Description	Safety Data for current and Last 3 Years			
	Current Year	Year 1 (Last FY)	Year 2	Year 3
		20__ - __	20__ - __	20__ - __
Fatalities (Nos.)				
Lost Workday Cases (Nos.)				

In case of no fatalities, LWDC during any year, the form may be filled stating NIL against the respective year. Bidders are encouraged to also submit the RCA / incident investigation reports and the learning's implemented out of the above reported incidents

4. Job Safety Plan/ Method Statement:

Bidder to provide / enclose a detailed Site/Job Safety Plan along with a Method statement detailing the execution philosophy (how the bidder intends to execute the Job/Project), identifying all key activities which are required to be performed by the Business Associate at Site. Bidder to also list down all high-risk activities and provide the Hazard Identification and Risk Assessment (HIRA) for all such high-risk activities involved in the site work.

(Use Method Statement template attached as Appendix 9)

5. PPE Requirement -

Division/DISCOM Requirement	Bidders Response
The Bidder/Vendor shall ensure that all PPE of Approved standards as per CSM F8 – PPE Requirements shall be always available and shall be used by his employees with no exception whatsoever. Bidders to also ensure Standard PPE matrix of Tata Power to be followed for all activities.	
10% Buffer stock of PPEs to be provided by bidders at each circle to meet any contingency	
Bidder will ensure that sample PPEs to be submitted/approved by Safety Department along with EIC at the time of submission of Safety bids for evaluation	

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In case bidder manpower found using substandard or any PPEs which are not approved by the Tata Power-Division /DISCOM representative, then Tata Power-Division /DISCOM will provide the same to manpower deployed at the cost of bidders.

6. Vehicle Deployment: Bidders to provide details of all vehicles deployed during execution of work-()

S. No.	Vehicle No.	Vehicle Type	Location	EV/CNG/Diesel/Petrol	Year	Whether CNG endorsed on RC

7. Crane Deployment-(): Bidders to provide details of crane to be deployed during the execution of work as and when required. Bidders to provide approved new gen crane ACE Model SX150, ACE FX150 and Escorts Model TRX 1550.

Sl No	Crane No	Location	Year

8. Training Records-(): Bidders to provide training records of employees deployed for the execution of work during last one year. These training includes OHS (Occupational Health and Safety) Training, Training on SOP/Work Procedures and Medical Emergency trainings imparted at their own facility, cost, and expenses. Bidders to provide the following details:

Tata Power-Division /DISCOM Requirement	Bidders Response
Training records of employees at their own facility, cost, and expenses for last one year	
Training facility available with Bidders	
Future road map for enhancing the competency of workforce	

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9. Rewards and Recognition-(): Bidders to provide the details of process deployed in their organization for sharing and resolution of safety concerns raised by their employees. Also, bidders to provide the details of Rewards and Recognition process in their organization for safety to encourage the morale of their workforce.

10. Management System Certification: -

Sr.No	Certification	Yes / No	If Yes, Year of Certification	If No, Target date for Certification
1	ISO 9001			
2	ISO 14001			
3	ISO 45001			
4	Any other (Specify....)			

Note: Please attach certificates to support above. In case not accredited for above but applied for, application letters may be attached.

CSM F7 Safety bid evaluation criteria. If any specific condition related to Contract is required to be conveyed to the Business Associate, Site safety team will attach the same as Annexure for specific conditions of job and submit it to contract team along with safety bid evaluation form. Commercial bid of Business Associate will be considered for evaluation by contract team only if Business Associate is qualified in safety bid. Site Safety Management Plan, defining the complete procedure of executing the job at site will be signed by the Business Associate and SCG after mutual agreement. Contract shall attach a copy of Site Safety Management Plan along with PO to the successful bidder.

CSM F7 - Safety Bid Evaluation Criteria (For Information to BA-Not to submit by BA) (R6)

Safety Bid Evaluation will be based on following parameters.

Evaluation Criteria

S. No.	Description	Max Marks	Criteria for evaluation
1.	Qualification and Experience of manpower	15	As per Clause No. 1 <u>CSM F6 (R6)</u>
2.	Tools and Tackles to be provided by bidder	15	To be evaluated as per approved tool list of concerned departments.
3	PPE Requirements	5	To be evaluated as per approved PPEs standard and PPE Matrix specified in <u>CSM F8.(R6)</u>

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4	Job Safety Plan/ Method	15	To be evaluated as per as per SOP/WI/HIRA
5	Vehicle Deployment	5	<u>Weightage will be given for CNG/Electrical Vehicles with endorsement of CNG kit on RC (R6)</u>
6	Crane and Mechanized heavy equipment Deployment	15	<u>Date of manufacturing or running hours or stipulated in laws.(R6)</u>
7	Training Records	5	Training records to be evaluated with evidence and scoring to be done as per availability of records
8	Certificate Accreditation	5	ISO 9001-2.5 Marks ISO 45001- 2.5 Marks ISO14001- 2.5 Marks. Total Max 5 Marks for all Three
9	Safety Initiative for learnings implemented in accidents in organization and work force (Fatal / Non-Fatal)	15	Maximum 15 marks will be awarded for visible evidence in terms of safety initiative deployed based on learning of accident in organization and workforce in case of accident
10	Rewards and Recognition Process	5	Maximum 5 marks will be awarded for R&R process evidence
Total		100	

Safety Records (Lag Parameter)-

1.	Fatal Accident	(-) 10 Marks for each case with max of 15 marks	For any fatality in Tata power /Other company in Current and last three years 10 marks will be deducted with maximum up to 15 marks. For new entrant BA, these marks will be deducted for Past safety records. If and BA found hiding such facts, then contract will be terminated immediately during the execution stage.
2	LWDC (Non-fatal)	(-) 5 Marks for each case with max of 10 marks	For each LWDC (Non-Fatal) case in Tata power /Other company in Current and last years, 5 marks will be deducted with maximum up to 10 marks. For new entrant BA, these marks will be deducted for past safety records. If and BA found hiding such facts, then contract will be terminated immediately during the execution stage.

Final Qualifying Criteria

S. No.	Description	Max Marks	Criteria for evaluation
1.	Qualified Bidders	More than 70 marks	Marks Obtained. 60 Marks for New business-like Odisha Discom for one year from CSCC implementation date.

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		Minimum Requirement	Weightage (%)	Score Obtained
Manpower	Safety Officer (1 per 500 workers) or as per requirement	Qualification - Safety Officer shall possess recognized degree in any branch of engineering with practical experience in similar industries of Min 2 years and Advance Diploma In Industrial Safety by State technical board. (Each state government prescribes the qualification of safety officer.). Require knowledge of Local language. Experience - Minimum 2-year experience in relevant field as mentioned in the job in PR.	5	
	Safety Supervisor (1 per work site up to max. 50 workers) <u>(For any specific & specialized work, site safety supervisor will be decided by SCG)/(R6)</u>	Qualification - Supervisor shall possess ITI/ Diploma in relevant field. PDIS is desirable, but not mandatory. Require knowledge of Local language. Experience - Minimum 5-year experience in relevant field as mentioned in the job in PR. Training – Trained and certified by Tata power Skill development Institute or equivalent institute in relevant safety procedures. Note: On request of the Business Associate /Users -TPDSI should vet & certify the skilled & experienced Technician if Technical Qualification is not adequate.	5	
	Qualified Technician (Skilled workers as electrician, rigger, fitter, welder, cable	Experience - Minimum 2-year experience (or experience prescribed by state government) in relevant field as mentioned in the job in PR.	5	

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	jointer, line men etc.)	Training – Trained and certified by TPSDI or equivalent institute in relevant safety procedures.		
Tools & Tackles	Equipment / Machines/ Tools & Tackles (lifting and shifting tools)	The list of Equipment /Machines / Tools and tackles to be used for job to be submitted by the Business Associate . Evaluation of the list will be carried out based on 1) Suitability as per the relevant job 2) Make and age of the tools from authorized agencies defined by the user. 3) Certification by the competent authority of respective state.	15	

CSM F8 - PPE requirements

The Business Associate shall ensure that the following PPE of Approved standards shall be always available and shall be used by his employees with no exception whatsoever. • PPE shall be conforming to BIS/DGMS/DIN specifications, in good condition and shall be comfortable to his employees, when used. This is indicative. For better clarification refer PPE procedure- **TPSMS/GSP/PPE/023**. as per safety terms and condition Appendix 3 CFM 3 in detail.

PPE Requirement

1	All Business Associate 's employees at site	Safety Florescent Jacket (orange color), Safety helmet & safety shoes with composite or steel toe cap
2	Workers mixing asphalt, cement, lime / concrete	Safety goggle & protective Hand gloves and footwear, Nose mask.
3	Welders / Grinders/Gas cutters	Welding screen/goggles, safety shoes, leather hand gloves, aprons, leg guard
4	Stone breaker	Protective goggle, hearing protection, anti-vibration hand gloves and Protective clothing.
5	Electricians / Linemen	Rubber hand gloves <i>with correct voltage rating and expiry date normally one year</i>

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		from Manufacturing date-() & Electrical resistant shoes, Safety helmet with induction strip to alert about presence of voltage for those linemen who climb the poles or work on electrical equipment
6	Workers working at a height of 1.8 Meter or above.	Double lanyard full body harness, fall arrestor and safety net made of reinforced nylon fiber ropes firmly supported with steel structures, Work positioning attachment

PPE Type and Testing Frequency

Sl. No.	Name of PPE	IS / EN Standard	Testing Frequency	Remarks
01	Leather Safety Shoes (Color – Black) with PU toe cap.	IS:15298 (Part-2)	Monthly and visual check every day for any crack or damage in the leather or sole.	
02	HDPE Safety helmet with chin strap and ratchet type for adjustment for non-Electrical work	IS:2925-1984	Monthly and visual check every day for any crack in shell.	
03	Full body harness (Safety belt)	EN 361	Monthly and visual check every day of the bends and the harness.	
04	Electrical Safety Gloves	EN: 60903 CE marked	Weekly and visual check for any crack and blow test before every work.	Manufactured not beyond 12 months.
05	Full face visor with safety helmet	EN: 166 CE marked (Visor)	Monthly and visual check every day for any crack in shell.	Clear acrylic visor attached with safety helmet.
06	Fireproof jacket for chest protection		Monthly and visual check every day.	
07	Safety helmet with induction Strip for linemen and working for electrical work-Class E	EN 397/2012	Monthly and visual check everyday	Induction Strip alerts presence of voltage

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08	Shorting clamps, crocodile clamps, Discharge Rod and Neon tester		Monthly and visual check everyday	For discharging the residual voltage and test before touch
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Pictorial View of PPEs for reference purpose

Sl. No.	Name of PPE	IS / EN Standard	Picture
01	Leather Safety Shoes (Color – Black) with PU toe cap.	IS:15298(Part-2) and with test report of electrical resistance.	
02	HDPE Safety helmet with chin strap and ratchet type for adjustment for Nonelectrical work and electrical work	IS:2925-1984/ EN 397/2012	
03	Full body harness (Safety belt) The straps at shoulder and thigh shall have full pad for comfort. The back shall be so designed that harness straps do not tangle with each other.	EN 361:2002 EN 358 : 2000 IS: 3521:1991/2002	

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04	Electrical Safety Gloves – Composite type Soft electrical gloves as per size of individual.	EN: 60903 CE marked	
05	Full face visor with safety helmet	EN: 166 CE marked (Visor)	
06	Fireproof jacket for chest protection		
08	Reflective jacket to each workman	As per Tata Power standard	

These pictures are indicative. Actual product may vary.

Note:

1. Any other Personal Protection Equipment required beyond above list will be according to BIS or EN Standards.
2. All Personal Protection Equipment will be checked by the engineer in-charge or SAFETY group of company.
3. Safety Representative of the BA must maintain the record of the availability, condition and checking of the PPEs.
4. All tools required as per the contract must be according to respective IS / EN standards.
5. Company may revise or add the above list of PPE and their specifications as and when feel necessary. The information about new specifications /models will be circulated by the Engineer In-charge (EIC), which shall adhere by the business associated in the shortest possible time. The EIC shall issue a memo / instruction to BA with timeline for implementation. Any delay will be treated as non- compliance / safety violations.

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CSM F9 - Site Safety Management Plan / Method Statement

Site Safety Plan / Method Statement (Template)

This Method Statement describes the specific safe working methods which will be used to carry out the described work. It gives details of work procedure with control measures to counter health and safety issues related to this work. The listed content of this Method Statement can be changed/modified subjected to job scope / specifications, but task specific method statement once finalized & approved, that should not be modified during work execution without permission from the approving authority.

Project/Job Name			
Scope of work: -			
Drawing References: -			
Detail of Sub Business Associate s involved: -			
Method Statement Prepared By: - Designation: - (e.g., Site Manager)	<u>Signature</u>	<u>Date</u>	

1.0 Introduction (*Describe purpose of the work, give details of type and scope of work being carried out*)

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2.0 Location of Work (*Give site address and precise location on site where work is to be carried out*)

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3.0 Safety Document /Specific Approval Required (Details of any safety documents or specific approval i.e., Client specific approval required to undertake the work)

5.0 Role & Responsibilities of Personnel/Parties Involved in activities: Clearly define roles and responsibilities of all personnel involved in activity i.e., Site management staff including sub-Business Associate s' staff, Project Manager/Site Manager of principal Business Associate , Sub Business Associate Site Manager, Project Engineer, Safety officer, Competent Supervisory Staff etc.)

6.0 Working/Activity Description: - *It is important that all operatives should have clear idea of those operational sequences and responsible supervisor must verify their competency prior to their engagement in operation.*

6.1 Pre-Working Checks

6.2 Resources (Equipment, tools including manpower) Details *i.e., Equipment and Tools, specific operational equipment, test kits, lifting resources, Details of materials to be used in operation, including any reference to COSHH assessments in case of use of any chemicals, Details of the manpower allocated to the task, e.g., titles, qualifications, competences, direct manpower, Business Associate s. Details of plant, tools, and equipment to be used for the work, including*

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the availability of relevant statutory documents, checks or inspections etc. Details of fencing, barriers, cones, chains, dangers notices, warning signs etc.

Tools required for work:

Sr.No	Tools /Equipment /Machine	UOM	Required Qty.	Remark
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

6.4 Operational Sequence of work: - *Full description of the work, setting out the methodology in a sequential manner, including any reference to any identified operational restraints. Also refer here sec. 5.0 responsibilities part for every step of work sequence).*

S. No	Activity	Details of job sequence	Risk Involved	Control Checks
1.				
2.				
3				
4				
5.				

6.7 Final Checks & restoration of work area after completion of work: *Those checks to be carried out by responsible supervisor in witness of his line hierarchy by use of specific checklist of certain operational checks and once those completed satisfactory, PTW (if applicable) to be closed and isolation arrangements to be restored by removing barricades/cautionary tags.*

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7.0 Task Specific Hazards: - *Refer to Task Specific Risk Assessment and attach in appendix*

Attachment: - Specific Risk Assessment

In addition, please provide below control measures in risk assessment (*as applicable*).

Fall Protection Measures: (Where Work at height cannot be avoided)							
Control Measures for Electrical Hazards							
Others Hazard if any (please provide details)							
Hazardous Substances to be used in job: (Attach MSDS if required)	 Acute Toxic	 Health Hazard	 Corrosive	 Dangerous For the environment	 Oxidising	 Highly flammable	 Explosives
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N

7.0 Emergency Provisions: *Relevant operational possibility of a programme in the case of emergency situation i.e. electrical supply restoration. In addition, emergency response provisions i.e., first aiders, firefighting, and first aid arrangements, nearest onsite/offsite emergency response also to be considered during emergency planning.*

8.0 "5S issues" / Waste Disposal/ Housekeeping and Environmental issues: *Details waste disposal processes and or housekeeping activities, Details of environmental impacts and control measures.*

9.0 Personal Protective Equipment (PPE): *Tick on PPE requirements for the task/Job*

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<i>Safety Helmet / Hard Hats</i>		<i>Safety Shoe / Safety Boots</i>	
<i>Gum Boot</i>		<i>Double Lanyard Safety Harness with work positioning attachment</i>	
<i>Electrical Hand gloves</i>		<i>Other hand gloves</i>	
<i>Eye protection</i>		<i>Respiratory protection</i>	
<i>Ear Protection</i>		<i>Electrical Arc flash suit</i>	
<i>Chemical resistant suit</i>		<i>Reflective Jackets</i>	
<i>Any Other</i>		<i>Any Other</i>	

10.0 First Aid facilities and Nearby Hospitals Details

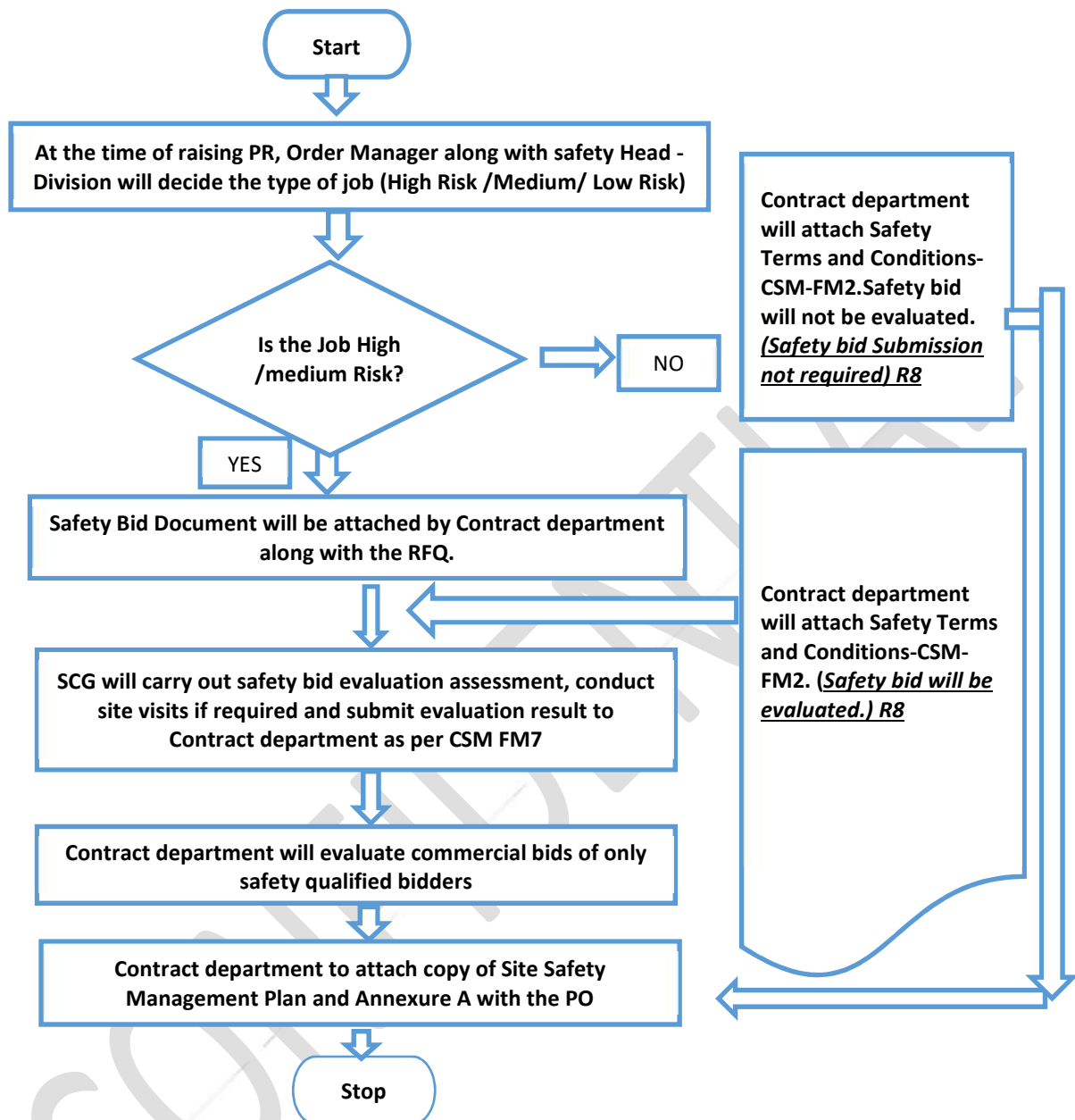
- Name of On Site First Aider
- First Aid Box Location
- Location of nearest hospital

11.0 Occupational Health, Fitness and COVID-19 related Preparedness:

- Please give a brief writeup / methodology of your organization's plan to avoid impact of the COVID-19 pandemic at Tata Power working site.
- Please give brief details of occupational health and hygiene related interventions planned by your organisation to ensure good health and fitness of workforce at Tata Power site.

4.3 Contract Award - refer CSM F5 Process Flow Chart for issuing RFQ and PO.

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4.4 Capability Building: Safety Training and capability building of workforce is a major component of safety management program. All training required must be provided and documented as specified by Tata Power and Indian Regulations. Tata Power Division /Discoms Safety department will audit Business Associates training and related documentation to assure its adequacy.

4.4.1 Before issuing gate pass:

For Odisha Discom/New Business: All Tata Power Business Associate and sub Business Associate workforce is required to attend Site Safety Orientation Training to receive a Safety Training Card, which is required to obtain a Gate Pass to the site, prior to entry. This Safety

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Orientation Course will be for duration of minimum half day. The information provided during the orientation will include, but is not limited to Job rules, personal safety, and conduct, Hazard's reporting, reporting of injuries, Emergency procedures, Safety Activities and Program including disciplinary measure and incentives, Critical safety procedure relevant to the job

For Tata Power Divisions: All Tata Power Business Associate and sub Business Associate workforce is required to attend L1 Training to receive a Safety Training Card, which is required to obtain a Gate Pass to the site, prior to entry.

4.4.2 Before start of actual work:

- Appropriate practical training such as SHE L1, L2& L3 is given to ensure that a jobholder, either supervisor or worker, is competent to do his/her job safely. The skill training is provided through TPSDI, and other agencies authorized by Tata Power on the list of 15 critical Safety procedures mentioned under safety procedures. Duration of course is as specified by Division/Discom
- Business Associate shall ensure that concerned workmen are provided with adequate training before he/she is allowed to execute the work. An evaluation test will be conducted after the completion of the training. Those employees who meet the minimum required competency will be provided with Certificate (Card), which will be valid for 3 years, post which the workmen have to reappear for assessment.
- If the workman is not able to qualify the assessment, he/she will be given 3 additional attempts to clear in 3-month time failing which he/she will not be allowed to work in the Division /Discoms.
- After expiry of Certificate or Training /Competency Card again one day recertification of L1, L2 and L3 skill training will be provided.
- Quarterly /Half yearly(For Odisha and New business) Revalidation Test - "SHE L1 Revalidation test" will be conducted for the Business Associate 's employees to revalidate their safety awareness and knowledge.
- Order Manager and Safety In charge of the Division/Site /Plant will conduct a Competency Assessment of all workforces, going to be deployed at site / plant for high-Risk job.
- The Contactor shall bear the conveyance and food expenses of his staff for attending training sessions and capability building sessions in new business-like Odisha Discom.
- The Contactor shall bear the entire cost of L1/L2/L3, the costs towards training, salaries/wages, boarding and lodging of his staff for attending training sessions and capability building sessions. These trainings are offered on nominal chargeable basis payable by Business Associate and rates shall be decided by TPSDI from time to time in case of training through TPSDI. Generally, L0 is of one day, L1 is for 2 days for each critical procedure and L3 is for one day. Around Rs 700+GST is approx. cost /Day/Candidate.
- Competency assessment of all critical workforce to be carried out for all who has taken L2 training.

4.4.3 Recognition to the Prior Learning in Safety

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If “Order Manager” recommends and “Head of the Safety Department of Discom” is satisfied with the safety knowledge and competency of the employee of Business Associate , a test may be conducted by Tata power Skill development Institute/ other recognized institute to assess the prior learning in safety. If employees of the Business Associate s pass in such test, he will be exempted from appearing in SHE L1 training. This assessment is on nominal chargeable basis and rates are decided by TPSDI from time to time.

4.5 Managing Work:

Order Manger shall -

- 1) Comprehensively assess and ensure field Safety implementation against Contract requirements and the Safety Management Plan.
- 2) Maintain a follow up process that drives continuous improvement in Safety practices and avoids repetition of common errors.
- 3) Order Manager and BA should aim at optimizing Safety performance of the Contract by working in a collaborative manner during the execution of the work.

This can be achieved by:

- Ensure that potential safety hazards are identified and controlled before any contracted work starts. Hazard identification should be conducted using multi-disciplinary teams which includes members from competent safety professional/execution team/competent BA supervisor & workforce to understand and identify project-specific safety hazards.
- Monthly inspection and replacement of damaged Personal Protective equipment -PPE & Critical Equipment, lifting Tools & Tackles and hand tools used at site.
- **PTW** - PTW procedure must be adhere and implement at site.
- Reviewing the Safety Management Plan (**CSM F9– Site Safety Management Plan**) before each stage of work begins.
- **TBT & Mass Meeting**: Every day Tool box talks to be conducted based on JSA/SOP with maximum participation of BA Workforce & Safety points to be shared by BA employee & line manager and 100% participation of BA employee & workmen in to mass meeting/communication.
- **BA Self safety audit**: BA Safety Supervisor will carry out daily safety audit and inspections of tools, tackles, equipment and PPEs. They will identify and help in correcting the unsafe acts and unsafe conditions created while executing job at site with the help of BA’s supervisors.

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- All respective **Critical safety Rules & Procedures and General safety Rules & Procedures** to be use and implement at site during job.
- "Suraksha Samwad" also known as Safety Interaction is a proactive safety initiative. In this program, leadership engages with BA workmen and employees in a scheduled 30-minute session to discuss and observe safety practices in the workplace.
- **Reporting safety observations by BA employee:** This involves the active participation of the workforce in identifying and reporting safety observations, which can help prevent accidents and improve safety performance.
- **Felt Leadership for Business Associates Proprietor /Co-ordinators:** This program aims to develop leadership skills within the Business Associates Proprietor/Co-ordinators. It encourages individuals to take ownership of their work and fosters a culture of responsibility and accountability.
- **Behavior based safety program (Jivan Ki Aur):** It aims to create regular awareness among all ground staff. It seeks to sensitize them, establish relationships, foster teamwork, enhance communication, motivate and empower everyone, promote good health, and enable a happy and safe life. The program will cover various activities such as morning meetings, home visits, personal meetings, group meetings, short training sessions, games, and other forms of engagement.

4.6 Periodic Evaluation:

1. During the time of job execution, regular site inspection will be carried out by the Tata Power-Division /DISCOM officials **mainly Line manager (R6)** to evaluate monthly safety performance of the Business Associate as per **CSM F11 Safety Performance Evaluation Report (R6)** and monthly score will be maintained by the Order Manager. Violations will be dealt as per **CSM F12 Safety Violation Penalty Criteria**. Please refer **CSM F10 Process Flow Chart for Safety Performance Evaluation**. Percentage of retention amount is usually mentioned in safety terms and conditions.
2. The evaluation criteria include Lead Indicators such as percentage of workers trained in TPSDI, inspection of critical equipment. Lag indicators such as Fatalities, LWDC and man-days lost.
3. In case of job stoppage due to safety violations / unsafe observations at the site, no time extension from PO completion date shall be given to the Business Associate, if such delays are attributable to Business Associate.
4. In case of fatality, limb loss or loss of property, vendor must pay for liability, legal, statutory, and additional mutually agreed settlement charges imposed by the appointed

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committee by Division Chief/CEO. This charge is over and above the retention amount. The committee will finalize penalty amount based on factors such as advice by statutory authorities, contract value and impact of accident etc.

5. Order Manager, Head of Business and functional Chief have the authority to terminate the contract as per **CSM F12 Safety Violation Penalty Criteria** Through contract department.
6. Site contract team will arrange Quarterly meeting with Order Manager to take feedback for Safety performance of Business Associates In-turn Site Leadership and Site Contract team will give feedback of safety performance so as to take Corrective actions (R6).
7. **CSM F11 Safety Performance Evaluation Report (R8) to be used to evaluate Star Rating of Business Associate for lead & Laq Indicator.**

4.6.1 Safety performance retention: A certain percentage of the bill value will be retained against every running bill as safety performance retention. The amount will be released with the last invoice or every six-month based on Safety Performance Score of Business Associate s. The retention amount will be calculated based on contract value as below.

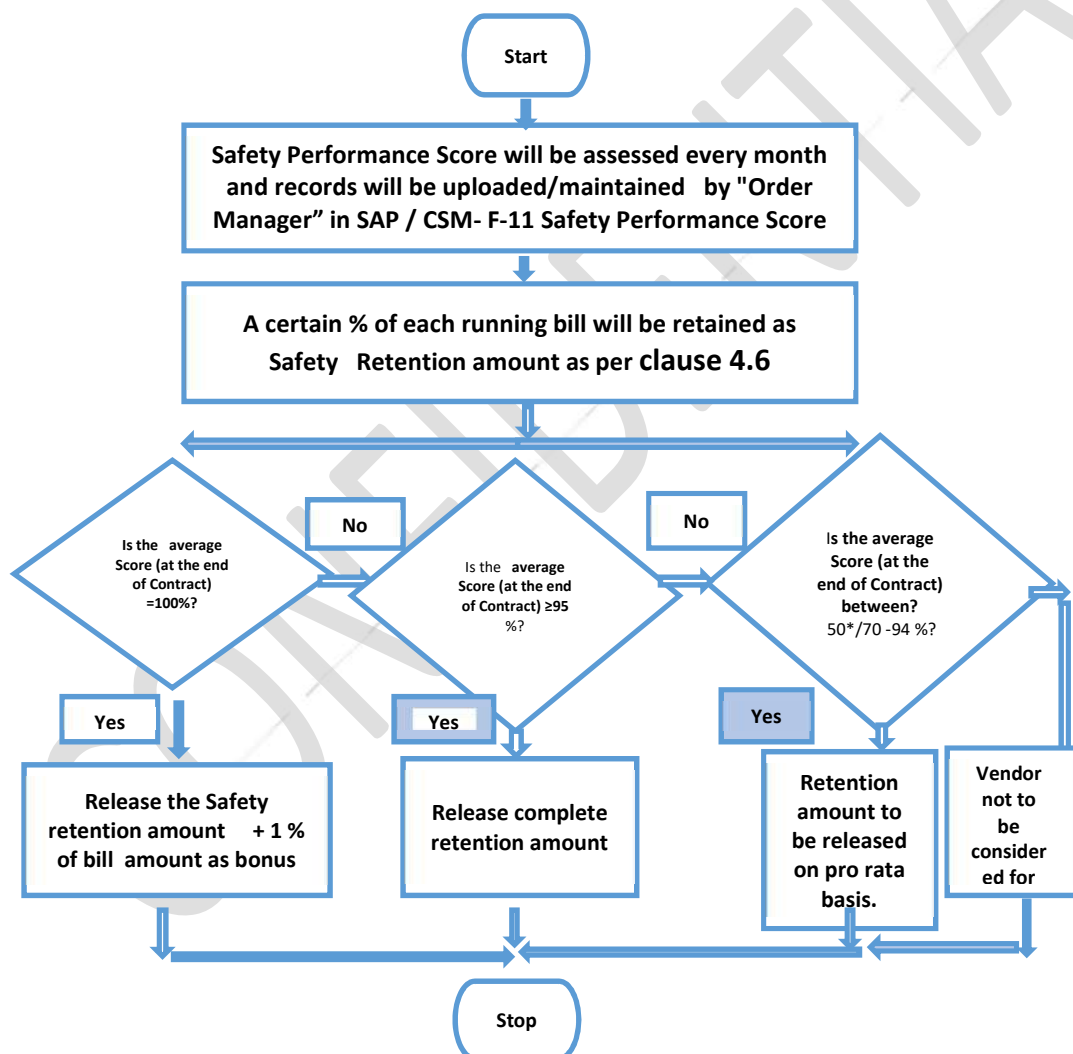
Risk Category	Contract Value	Retention Amount (%)
Very high/High risk job/ Medium Risk jobs	Up to 10 Lakhs	2.5
Very high/High risk job/ Medium Risk jobs	10 – 50 Lakhs	2
Low/Very Low Risk jobs	10 – 50 Lakhs	1
Very high/High risk job	0.5 to 10 Cr	2
Medium Risk jobs	0.5 to 10 Cr	1.5
Low/Very Low Risk jobs	0.5 to 10 Cr	1
Very high/High risk job	>10 Cr	1.5
Medium Risk jobs	>10 Cr	1

1. The safety retention amount will not be applicable if there is clause of Contract Performance Bank Guarantee (CPBG) and safety performance of Business Associate is as per desired criteria.
2. If safety performance of Business Associate is not as per desired criteria (as per Appendix 10 – CSM F10 – Process Flow Chart for Safety Performance Evaluation and Appendix 11: CSM F11 - Safety Performance Evaluation Criteria)-then safety retention percentage as mentioned in table above will be deducted from running bill.
3. Bidder to give understanding that if there are any deductions required to be made for safety non-performance as per the Safety Performance Score, then Tata Power shall recover any such deductions against safety non-performance directly from the monthly bills / final settlement or it shall be within its right to recover such sum from accounts payable or the CPBG or the retention of the Business Associate available with Tata Power for the said contract between the Business Associate and Tata Power.

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4. The retention amount against non-safety performance saved and Penalty will go to a separate Safety Improvement Fund.
5. For the contract value of more than Rs 1 Cr or contract duration more than 12 months, the retention amount shall be released half yearly based on safety performance. For all remaining contracts, the retention amount will be released with the final bill.
6. Safety performance bonus 1% (limiting to 50 lakhs) of the invoice value will be considered at the end of the job if the contractual safety performance score is 100%

CSM F10 – Process Flow Chart for Safety Performance Evaluation



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CSM F11 - Safety Performance Evaluation Criteria (R6)

Safety Performance Evaluation Report- CSM F11

BA field safety audit (Safety Performance Evaluation for BA).

Division		Function					
Name of BA		Month					
Nature of Work		PO					
	A. <u>Lead Indicators</u>		100 (for star rating score will dividend scale of 2.5)				0
	-	UOM	Target				Actual score for the month
1	% of employees certified in Skill development institute/ authorized agency/Card issued.	% Workforce covered	100%	51% to 99%	50%	<50%	
	Score		10	Pro-rata	5	0	
2	Business Associate Safety Field Audit score	Severity score	2 to 3	3 to 4	>4		
	Score		10	5	0		
3	Monthly inspection and replacement of damaged Personal Protective equipment -PPE by contractor(Safety shoes, Induction helmet, full body safety harness with work positioning lanyard, rubber insulated gloves, reflective jacket etc.as per Job requirement)	% of total workforce	100%	99% to 50%	<50%		
	Score		10	5	0		
4	Monthly inspection and replacement of damaged Critical Equipment, lifting Tools & Tackles and hand tools used at site by BA (Neon Tester, Discharge rod,	% Total T&T	100%	99% to 50%	<50%		

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	ladders Vehicle, Tools & tackles carried out and defective equipment replaced as required.						
	Score		10	7	0		
5	Unsafe Conditions/Acts (Potential Hazards), near miss(Close calls), minor injury(First aid cases and MTC) cases reported	Observation / Nos of workforce	0.50	0.25	<0.25		
	Score		10	7	0		
6	Monthly R&R for workforce along with Tata power reparative monthly	% of total workforce	10%	5%	0		
	Score		10	5	0		
7	Nos of workforce covered under program under Jivan Ki Aur/Ghar se Ghar tak/Surkhshit Pariwar ki aur	% of total workforce	10%	5%-10%			
	Score		10	0			
8	Safe (designated way) Disposal of Waste generated, Records of waste (Hazardous Waste – Oily cotton waste – E-waste etc.) generation. No effluents to drain/discharges to ground		YES	NO			
	Score		10	0			
9	<u>Daily Toolbox talk and Weekly Mass communications covering 100 % workforce and records maintained or not(R6).</u>	% of total workforce	100%	50-100 %			
	Score		10	5			
10	<u>Check for housekeeping at site(R6)</u>	At least 3S.	YES	NO			
	Score		10	0			

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	B. <u>Lag Indicators</u>		50 (for star rating score will dividend scale of 2.5)				0
			Target				
1	Number of Fatalities		0	>0			
Score	Score		30	0			
2	No of LWDC - Reportable		0	>0			
Score	Score		10 / 20*	0			
3	Major Fire		0	>0			
Score	Score		10 / 0*	0			
	Total score		150				0
	* Odisha					%	0

CSM F12 - Safety Violation Penalty Criteria

Major Violations and Escalation matrix-

Consequence of safety violation observed not related to incidents or accidents		Violations				
Sl. No.	<u>Safety Violation</u>	1st	2nd	3rd	4th	<u>Subsequent violation</u>
1	Working without required PPE such as Helmet/gloves/safety shoes/Safety harness etc.	A	B	C	D	Will Attract the same penalty as 4th violation
2	Working without proper tools and tackles	A	B	C	D	
3	Poor or bad condition of Crane/Hydra/Vehicle and/or Incompetent driver and/or helper).	B	C	D	E	Termination of Contract and blacklisting after repetition of violations (3 to 4 times as the case may be)
4	Improper Working at Height	B	C	D	E	
5	Untrained /unauthorized workman engaged in high-risk jobs	B	C	D	E	
6	Violation of SOP or WI or LOTO	C	D	E		
7	Working without PTW or LC / Without authorization / Without creating Safe Zone	C	D	E		

Legend	Action to be Taken	Responsibility	Penalty (INR)	Repeat Violations
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A	Levy of Penalty	Order manager / EIC	5000	The no. of repeat violations shall be calculated cumulative during the FY and deduction will be done from the monthly bills.(R6)
B	Memo to BA and Levy of Penalty	Order manager / EIC	10000	
C	Memo to BA and Levy of Penalty	Order manager / EIC	25000	
D	Memo to BA and Levy of Penalty	Order Manager / EIC	50000	
E	Memo to BA, Levy of Penalty, Termination of Contract, Blacklist	Order Manager / EIC	100000	

Other Violations and Penalty

Penalty shall be imposed on the Business Associate s under the following circumstances for breaching the contractual agreements. The list is not exhaustive, but indicative.

Sl. No	Description of Violation	Severity	Penalty (INR)
1.	Unhygienic/Bad condition of PPE	2	500
2.	Unsafe Act/Condition of Severity 4	4	4000
3.	Unsafe Act/Condition of Severity 5	5	5000
4.	No Earthing of Electrical equipment	5	5000
5.	Working without efficient supervision	4	4000
6.	Non-reporting of incidents	3	3000
7.	Starting the job without Toolbox Talk	4	4000
8.	Electric cable tied with metal wire / Use of damaged electrical cable / Use of two core cable	3	3000
9.	Rubber mat not available in front of electrical panels.	3	3000
10.	Inserting naked wire into the socket instead of a plug	5	5000
11.	Inflammable materials stored inside PSS/FCC/Distribution Room	5	5000
12.	Water accumulation found near electrical panels / equipment	5	5000
13.	Grinding wheel/ Coupling/ Piling winch/other rotating parts without guard	4	4000
14.	Inadequate illumination of working area	3	3000

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15	Bringing inside PSS/FCC or any other work area any chemicals without approval.	5	5000
16	Loose materials in work area which can fall down or fly during a storm	5	5000
17	Misusing emergency facilities like fire hydrant line/ hose box/ spray system/ eye wash etc.	3	3000
18	Entering restricted areas like switch yard, hazardous material storage room etc. without authorization	3	3000
19	Not using 24 V lamp inside confined spaces	3	3000
20	Bypassing/overriding safety interlocks	5	5000
21	Working besides road without proper barricading and monitoring of traffic	5	5000
22	Smoking in prohibited area (Closed Go-downs, Storage of flammable material, Storage of Gas cylinders, PSS , Offices etc.)	3	3000
23	Improper stacking of materials in Storage Yard	4	4000
24	Sleeping at workplace	3	3000
25	First aid box not available / in locked condition	2	2000
26	Appointment of subBusiness Associate without his Safety Bid Evaluation and/or without the permission of engineer in charge or Order manager.	5	5% of order value
27	Bad Housekeeping with respect to TPSMS/GSP/GHK/022 1st Instant 2nd instant 3rd instant 4th instant - Subsequent instants	2	1000 2000 5000 10000 10000
28	Violations related to vehicles with respect to TPSMS/CSP/RSP/015 . - Parking without wheel choke - Parking in undesignated area - Heavy vehicle without helper or co-driver - Seat belt not available / not used - Driver without license - Heavy vehicles without reverse horn - Using mobile phone while driving - Lights/mirrors not working /broken	3	1000 per each violation

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28	Violation in Gas cutting and Gas cylinder handling • Cylinder valve without guard • No flashback arrester • Leaky DA/Oxygen hose • Cylinders not kept in secured manner • Cylinder trolley not available • Cylinders are transported by manual rolling	5	2000 per each violation
29	Violations in Lifting Operations w.r.t. to TPSMS/CSP/HEMS/005 • Hook latch missing • Load raised or swung over people or occupied areas of building • Persons standing within the swing area of the crane • No barricading of crane working area • Use of damaged lifting tools and tackles • Lifting tools and tackles not tested / Test certificate expired • Crane operator without proper license • Angular loading • Lifting / shifting heavy material without guide rope • Using mobile phone during loading and unloading jobs	5	2000 per each violation
30	Violation in Scaffolding work w.r.t. to TPSMS/CSP/SCAF/007 • Unstable scaffolding/nonstandard Scaffolding in use • Handrails/mid rails/toe guards missing • Safety harness not anchored on fixed structure • Opening found in working platform	5	2000 per violation
31	Violation in Excavation Work w.r.t. to TPSMS/CSP/EXS/002 • Loose material falling into excavated pit • Water logging in excavated pits / trenches • Inadequate or no barricading • Undercut / cave in found on sides of excavated pits	4	2000 per violation
32	Caution boards, danger signs (luminescent /red) along with emergency contact number are not found displayed.	3	3000
34	Spillage of hazardous material/chemicals during transportation	4	4000

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Penalty for Incidents / Accidents-()

Consequence of incident / Accident		Incident / Accident				Action Required
Sr.No.	Type of Injury	1st	2nd	3rd	4th	
1	Major Injury (Bone injury or burn or hospitalization >48 hrs.) Non-fatal	F	F	G	G	Intolerable
2	Major Injury (Bone injury or burn or hospitalization >48 hrs.) Non-Fatal (Two or more non-Fatal in one event)	G	G	H		
3	Single fatality	G	H			
4	Multiple fatalities (Two or more fatalities in one event). Anywhere in Tata power.	H				

Legend	Action to be taken	Responsibility	Penalty (INR)	The no. of violations shall be calculated cumulative during FY and deduction will be done just after Consequence of incident / Accident(R6)
F	Memo to BA and Levy of Penalty	Order Manager/Engineer in charge	200000	
G	Memo to BA and Levy of Penalty	Order Manager/Engineer in charge	500000	
H	Memo to BA, Levy of Penalty, Termination of Contract and Blacklisting the BA	Order Manager/Engineer in charge	1000000	

5.0 Tools and Tackles

5.1 Tools & Tackles used to carry out the job shall be checked and inspected by Order Manager and safety Officer.

5.2 Vendor must submit a valid Certificate from Competent person under the Factories Act 1948 and State Factories Rule for all Lifting Tools and Tackles (like Hoist, D

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Shackles, chain Block, wire ropes etc.).

5.3 All Electrical Hand Tools must be tested for leakage of current by a person /agency authorized by Tata Power Division /Discoms. Electrical power must be taken through RCCB of 30mA. Electrical hand tools should not have cord more than 3 meters in length. If power source is at > 3 meters, extension boards with RCCB of 30 mA and ON/OFF switch, shall be used.

5.4 Removal or inclusion of tools any new tool /tackles / machinery / equipment at site should only be done with concurrence of the order Manager / Head Safety.

6.0 Site Safety Rules and Procedures:

The work in the safest possible manner can only happen when it has been carefully planned and all applicable procedures are followed. The Tata Power Safety Procedures are derived from Tata Power best practices and the applicable Government acts regulations. In each case, the most stringent regulation is used. All safety rules and procedures developed from time to time shall be mandatorily followed by the vendor and his employees while working at Site.

7.0 Critical safety Rules and Procedures:

Following is the list of Tata Power's critical Safety Rules and Procedures. Business Associate shall refer to approved Rules and Procedures for detailed requirements and ensure conformance

7.1 Lock Out and Tag Out Procedure.

This procedure is intended to be used for the protection of Personnel while servicing or performing maintenance on distribution network/ equipment / pipeline / vessel / process systems. This is a general procedure that shall be used as the minimum requirements for isolation of equipment, pipelines, machines, system from all possible sources of hazardous energy and / or material such as Steam, Hot Water, Compressed Air, any other process fluid / chemical energy /Mechanical energy or Electrical energy. For complete procedure kindly refer Procedure Document No. **TPSMS/CSP/LOTO/001**

7.2 Excavation Safety (Shoring and Sloping) Procedure

This procedure is developed to cover the safe practices required for shoring and sloping in excavation and trenching jobs. This procedure is developed to establish mandatory requirements for practices to protect personnel, property and equipment from hazards associated with above activities. For complete procedure kindly refer Procedure Document No **TPSMS/CSP/EXS/002**

7.3 Confined Space Entry Procedure:

This procedure outlines the steps required to perform the confined space entry and to protect personnel from the hazards of entering and conducting operations in confined spaces. For complete procedure kindly refer Procedure Document No – **TPSMS/CSP/CSE/003**.

7.4 Working at Height Procedure:

This procedure describes the rules and procedures to protect employees from the hazards of working at heights. This procedure is developed to cover the safe practices

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required for Working at Heights. This procedure is developed to establish mandatory requirements for practices to protect personnel from hazards associated in this area. For complete procedure kindly refer Procedure Document No – TPSMS/CSP/WAH/004.

7.5 Heavy Equipment Movement Safety Procedure.

Heavy equipment lifting and movement is an activity involving loading, unloading, storage and movement from one place to another including lifting and erection or repairing of equipment with cranes or hoists. Material, machinery and equipment handling operations are being carried out by large capacity cranes and hoists, which make the job safer and faster. This procedure addresses the hazards and precautions associated with such equipment and their use. For complete procedure kindly refer Procedure Document No –TPSMS/CSP/HEMS/005.

7.6 Mobile Crane Safety Procedure.

Mobile cranes are responsible for many incidents, injuries. Falling loads from mobile cranes pose a severe hazard to operators and nearby workers and property. Many types of cranes, hoists, and rigging devices are used for lifting and moving materials. To maintain safe, appropriate standards must be adhered to and only qualified and licensed individuals shall operate these devices. For complete procedure kindly refer Procedure Document No –TPSMS/CSP/MCS/006.

7.7 Scaffold Safety Procedure.

This procedure is developed to provide information on the safe erection, use, dismantling and maintenance of access scaffolding in the workplace. It is developed to establish mandatory requirements for practices to protect personnel from hazards associated with erection, use and dismantling of scaffolds. For complete procedure kindly refer Procedure Document No –TPSMS/CSP/SCAF/007.

7.8 Permit to Work Procedure.

Given the inherent hazards of the power generation and distribution industry, a significant number of TATA POWER operations and installations are critical. Work Permit (WP) System is an essential element in controlling the workplace risks in an effective manner. For complete procedure kindly refer Procedure Document No – TPSMS/CSP/PTW/008.

7.9 Job Safety Analysis (JSA) Procedure.

This objective of this procedure is to have a task-based risk assessment process in place that identifies, evaluates and controls the risks associated with work activities, and as a result, prevents those involved in the task or those potentially affected by the task, from being harmed. For complete procedure kindly refer Procedure Document No- TPSMS/CSP/JSA/009 REV 01.

7.10 Electrical Safety Procedure.

The objective of these standards is to specify minimum mandatory requirements and advisory guidance for identifying and controlling hazards to ensure 'Zero Harm' regarding operation maintenance and testing of electrical equipment. For complete procedure kindly refer Procedure Document No- TPSMS/CSP/ELEC/010

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7.11 Fire Safety Management Procedure.

Objective of This standard is to specify the minimum mandatory requirements and advisory guidelines to ensure prevention of fire related incidents and managing / controlling their impacts if they do occur. For complete procedure kindly refer Procedure Document No - TPSMS/CSP/ELEC/011

7.12 Hazard Identification & Risk Assessment (HIRA) Procedure:

Objective of this procedure is to define guidelines for Hazard identification, Risk assessment and determination of controls. For complete procedure kindly refer Procedure Document No - TPSMS/CSP/HIRA/012.

7.13 Management Of Change (MOC) Procedure:

The objective of this document is to establish the procedures necessary to ensure that HSE risks are managed to an acceptable level in Tata Power Management of Change (MOC) process. For complete procedure kindly refer Procedure Document No - TPSMS/CSP/MOC/013.

7.14 Pre-Start-up Safety Review (PSSR) Procedure.

Objective of this procedure is to provide guidelines for safe initial startup of a new facility or restart of a modified facility. The PSSR process verifies that the new/modified facility meets the original design and operating parameters. The intent is to prevent incidents caused by inadequate, incomplete, unauthorized design, construction, installation, and/or commissioning. For complete procedure kindly refer Procedure Document No - TPSMS/CSP/MOC/014.

7.15 Road Safety procedure:

To provide Safety Rules for road travel management and safe usage of all types of vehicles viz. passenger/ commercial, owned/ hired by company, driven by employees or Business Associates. For complete procedure kindly refer Procedure Document No - TPSMS/CSP/RSP/015.

8.0 General safety Rules and Procedure:

8.1 Lift (Elevator) Safety Procedure:

To provide safe operating procedure for taking control of lift car before entering and existing the pit of OTIS make elevators. For complete procedure kindly refer Procedure Document No – TPSMS/GSP/LIFT/001,

8.2 Working on conveyor belt Procedure:

This procedure is developed to cover the safe practices required for Working on live equipment and to protect personnel from hazards associated with it. For complete procedure kindly refer Procedure Document No – TPSMS/GSP/CONV/003

8.3 Batteries Handling & Disposal

To provide procedure for recycling and / or safe disposal of used / waste batteries in compliance with all legislation. For complete procedure kindly refer Procedure Document No – TPSMS/GSP/HAZM/003

8.4 Material Handling and Storage Procedure:

The purpose of this document is to provide procedures to assist the safe handling

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of materials (manual handling and mechanical handling). For complete procedure kindly refer Procedure Document No – **TPSMS/GSP/MATL/004**.

8.5 Office Safety Procedure:

The objective is to provide a safe working environment to those working in office premise, who may be exposed to emergency situations and other chronic / cumulative risks that may arise due to various reasons of unsafe act, unsafe condition, fire and or pandemic crisis like COVID-19 etc. For complete procedure kindly refer Procedure Document No - **TPSMS/GSP/OFS/006**

8.6 Earth Leakage Circuit Breaker (ELCB) Testing Procedure):

The objective of this procedure is to define the minimum requirements for testing of Earth Leakage Circuit Breaker (ELCB). For complete procedure kindly refer Procedure Document No - **TPSMS/GSP/ELCB/008**.

8.7 Occupational Health & Safety Legal Compliance Procedure:

Objective of this procedure is provide guidelines for compliance of Occupational Health & Safety (OH&S) legal requirements and all ratified protocols and agreements are incorporated in Tata Power Safety Management System (SMS). For complete procedure kindly refer Procedure Document No - **TPSMS/GSP/LEGL/009**.

8.8 Incident Reporting & Investigation Procedure:

Objective of this procedure is to outline the process for reporting, recording and investigating an incident, recommending corrective and preventive actions and to communicate the lessons learned to prevent recurrence of similar incidents. For complete procedure kindly refer Procedure Document No - **TPSMS/GSP/IRI/011**.

8.9 Business Associate Safety Management Procedure.

The purpose of this document is to engage with Business Associate s in a way to create safe work environment for everyone working for Tata Power. For complete procedure kindly refer Procedure Document No – **TPSMS/GSP/CSM/015**.

8.10 Tree Trimming Procedure:

The objective of this procedure is to define guidelines and minimum requirements for Tree trimming. For complete procedure kindly refer Procedure Document No – **TPSMS/GSP/TTRM/017**

8.11 Safe Lone Working Procedure:

Objective of this procedure is to lay down guidelines for reduction and safe managing of any additional risk arising from lone working. For complete procedure kindly refer Procedure Document No – **TPSMS/GSP/LONE/019**.

8.12 Good Housekeeping(5S) Procedure:

Objective of this procedure is to explain the meaning, importance and provide guidelines for implementation of Good Housekeeping(5S) at workplaces across organization. For complete procedure kindly refer Procedure Document No – **TPSMS/GSP/GHK/022**.

8.13 Personal Protective Equipment:

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This procedure describes the basic requirements, applicability, minimum specifications of Personal Protective Equipment (PPE). For complete procedure kindly refer Procedure Document No – **TPSMS/GSP/PPE/023**.

8.14 Process Safety Management Procedure:

The objective of this document is to provide a standardized & uniform guideline to implement Process Safety Management in Tata Power, its JVs, and subsidiaries to prevent or minimize the consequences of releases of toxic, flammable, pressurized or uncontrolled chemicals/Steam/Water or any other material which may result in toxic, fire, explosion, burn or flood like situation. For complete procedure kindly refer Procedure Document No – **TPSMS/GSP/PSM/024**

The above procedures will be updated time to time and the updated version of the procedures as well as any additional critical procedure will be available on official website of Tata Power (www.tatapower.com) for your reference.

9.0 Pre-Employment and Periodic Medical check-up:

Business Associate shall arrange to conduct a pre-employment and periodic medical check-up for its entire workforce by Tata Power medical officer or Tata Power authorized medical officer. The Business Associate shall be able to produce the certificate prior to the employment. The Business Associate shall also organize to conduct periodical medical checkup (six monthly) for the following category of employees:

- Drivers (Check for Vision & Hearing)
- HEM Equipment Operators (Check for Vision & Hearing)
- Workforce working at Height (Check for Vision, Hearing, Vertigo & Height Phobia)
- Workforce Handling the hazardous substances - Coal, ash and chemicals (Chest X-ray and Lung Function T)
- Workforce in high Noise area (> 90 Decibel), Check for Hearing
- Workforce handling radiography equipment for conducting NDT.
- Workforce, working in specific areas requiring specific medical attention should conduct the medical tests test as laid down in the respective Site Safety Management Plan.

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10.0 Other Conditions:

10.1 The manpower/vehicles/Tools & Tackles/Equipment provided shall be as per mutually

Sr. No	Type of Audit	Frequency
1	Tool Bag and PPE audit	Weekly
2	First Aid Box Maintenance Record	Fortnightly
3	Fire Extinguisher Record (Applicable for the BA involved in major construction works and have storage of flammable material at worksite)	Monthly
4	Safety Talk Register	Weekly
5	Site Safety Audit	Daily

agreed SLA.

10.2 No Supervision No work policy should strictly be followed.

10.3 Test Before Touch must be ensured every time a job is being carried out in electrical network.

10.4 HIRA /JSA as per the job scope must be prepared in detail and submitted along with Site Safety Plan by the successful bidder.

10.5 Personal protective equipment (PPE) must always be checked before use to ensure that they are in good condition and clean. Replace them if necessary.

10.6 All relevant PPE shall be provided by the vendor while working at the site.

10.7 Housekeeping shall be maintained all the time while execution of work. All the unwanted material shall be removed from the site at the end of the day's work. Old/damaged parts if taken out of the system shall be kept at identified place and it shall be shifted to scrap yard or disposed of as per instruction of order manager.

10.8 Site Safety Plan shall be prepared by successful bidder along with order manager. Appendix 1 to be filled by successful bidder and submitted to Tata Power safety in-charge, before mobilization of team at site and start of the work.

10.9 The Owner or Proprietor of BA must visit worksite at least once in a month and meet Order Manager every month. In case of incidents, the Owner or Proprietor of BA is required to attend Time Out Meetings to understand the gaps that contributed to the incident.

11.0 Schedule of Safety Audits by BA Safety Staff

Safety Undertaking of BA by way of Affidavit

I _____ s/o _____ R/o _____ (AUTHORIZED REPRESENTATIVE/PARTNER/DIRECTOR/PROPRIETOR) of M/S _____ (name of company/firm) having its office at (Complete address of Company), authorized vide power of attorney dated -----/Board resolution dated----/letter of authority dated----, hereinafter referred to as **Business Associate [or Business Associate (BA)]** which expression shall, unless it be repugnant to or inconsistent with the meaning or context thereof, be deemed to include its heirs, executors, administrators, and assigns do hereby affirm and undertake as under :

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1. The present undertaking shall remain in force from the date of execution of contract and shall be valid till the date of termination of the said contract by either party. The undertaking is binding on me (Business Associate) as well as my sub-Business Associate and its employees, representatives etc.
2. That I (the Business Associate) will be responsible and liable to comply and abide by all the safety rules, instructions and regulations as may be specified and laid down by the Discom to achieve its goal of Zero for on-site incidences.
3. That the Business Associate shall be fully responsible for ensuring occupational health and safety of its employees, representatives, agents as well as of its subBusiness Associate 's employees, at all times during the discharge of their respective obligations under the contract including any methods adopted for performance of their tasks / work.
4. That Business Associate shall ensure ,at its own expense to arrange for and procure, implement all requisite accident prevention tools, first aid boxes, personal protective equipment, fire extinguisher, safety training, Material Safety Data Sheet, pre-employment medical test, etc. for operations & activities including as & when so specified by Discom specifically. , failing which Discom shall be entitled, but not obliged, to provide the same and recover the actual cost thereof from the Business Associate 's payments.
5. That the Business Associate shall engage adequate and competent Safety – Supervisor / Engineer / Manager / Skilled persons at site as per the Para 5 (Qualification and experience of safety personnel) and Annexure 3 of Contract Safety Management.
6. That the Business Associate shall engage the competent Site – Supervisor with each group of workers for safe and correct workmanship, proper co-ordination of material and site work as per contract.
7. That the Business Associate shall immediately replace supervisor in case it is found to be not up to the level of skill and experience required, but any such replacement shall be only with the prior concurrence of the Discom representative.
8. That the Business Associate and its sub Business Associate s shall abide by all the safety guidelines as per Safety Manual, Contract Safety Management and other guidelines issued from time to time by Discom during the contract period.

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9. That in case the Business Associate and/or any of its Sub Business Associate fail to ensure the compliance as required in terms of this undertaking the Business Associate shall keep and hold Discom / its directors / officers / employees indemnified against any / all losses / damage / expense / liability / fines / compensation / claims / action / prosecutions or the like which might be suffered by Discom or to which Discom might get exposed to as a result of any breach /wilful negligence /deliberate default on the part of the Business Associate /Sub Business Associate in complying with the same. Business Associate shall also furnish any press release, clarification etc. if sought by Discom for any near miss or safety violations, accidents, which are attributable to fault of Business Associate .

DEPONENT

VERIFICATION

Verified aton this _Day of _____ 20__ that the contents of the above affidavit are true and correct and nothing material has been concealed therefrom.

12.0 General Safety Conditions for various contracts Specific to Odisha Discom

12.1 Safety Conditions for maintenance of STS (Sub Transmission System) Network.

A BA awarded a major contract work of maintenance of sub – transmission network in area of a power system will be required to fulfil the following conditions:

- Availability of Discharge Rods - Minimum 6 Nos. in each maintenance vehicle, fit for purpose and in good conditions and defective rods are removed from service.
- Availability of Neon tester - Minimum one Neon Tester in each Maintenance Vehicle, in good and working condition and defective or non-standard neon testers are removed from service.
- Electrical hand Gloves - Minimum two sets of 33 KV and two sets of 11 KV in maintenance vehicles.
- The BA linemen must be having required ELBO certification for the voltage level involved.
- BA shall provide Safety Policy, Safety Objectives, Organogram showing structure and responsibility of Safety management of his company and shall document the work practices and procedures in terms of Safety Management.
- BA shall comply with all statutory requirements like applicable acts, regulations, codes of practice, OHSAS Standards, Labour laws, etc.
- The BA shall participate in Safety promotional activities like celebration of Lineman day on 4th March, National Fire Service Day on 14th April and Theme based safety campaigns undertaken by the Discoms every month.
- BA shall abide by Safety manuals and guidelines of Discom issued from time to time.

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- BA shall ensure safety training and induction program for the employees. The BA employees must carry safety training card / competency card to the worksite and produce the card on demand.
- All BA employees must be given valid ID card issued by BA cell of Discom who will check statutory compliances before issuing ID cards.
- BA shall not employ a new workman without training and issue of ID card.
- BA shall conduct safety audits & inspections as per Discom procedures.
- BA shall provide proper PPEs as per CSM F-8 ensure periodic inspection of PPE, Tools and tackles to ensure their serviceability.
- BA shall ensure the adherence to standard operating procedures or guidelines laid down by the Discoms.
- BA shall ensure that no job shall be carried out without efficient supervision.
- BA shall ensure reporting of any unsafe act, unsafe conditions, near miss, incident, or accident to engineer in-charge and SAFETY team of the Discom.
- BA shall provide safety performance and Safety MIS to engineer in-charge and Discom SAFETY group periodically. Based on any non-confirmation to the safety procedures and guidelines, BA is liable to be negatively marked for his performance and suitable penalty will be imposed.
- BA safety staff shall work as per the guidance of the Discom safety department and functionally report Safety Head of Discom. Any leaves by safety staff of the BA shall have to approved by Discom Safety Department.
- BA shall ensure to depute Safety Staff for managing safety in worksites. In case the BA has been awarded work in more than one area power system, then the following safety structure will be adopted.
- Safety manager and Safety engineer must be having PDIS or ADIS.



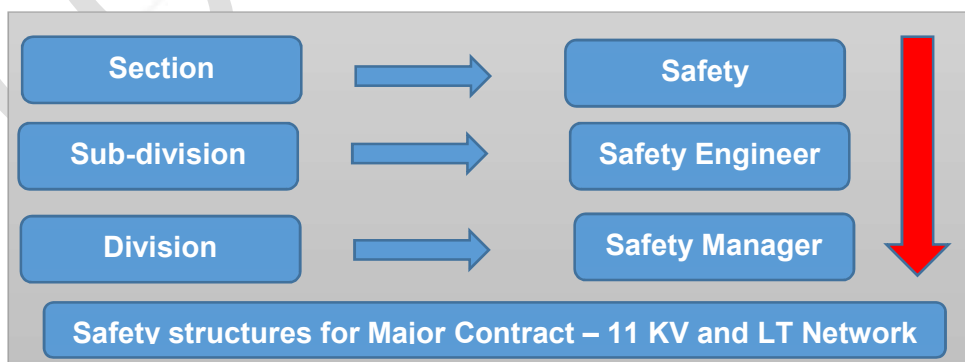
12.2 Safety Conditions for maintenance of 11 KV and LT Network.

A BA awarded a major contract work of maintenance of 11 KV and LT Network in area of a power system will be required to fulfil the following conditions:

- Availability of Discharge Rods - Minimum 6 Nos. in each PSS/FCC and maintenance vehicle, fit for purpose and in good conditions and defective rods are removed from service.
- Availability of Neon tester - Minimum one Neon Tester in each PSS/FCC/ Maintenance Vehicle, in good and working condition and defective or non-standard neon testers are removed from service.
- Electrical hand Gloves - Minimum two sets of 33 KV and two sets of 11 KV in each PSS/Maintenance vehicles and two sets of LT hand gloves at each FCC.
- The BA linemen must be having required ELBO certification for the voltage level involved.

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- BA shall provide Safety Policy, Safety Objectives, Organogram showing structure and responsibility of Safety management of his company and shall document the work practices and procedures in terms of Safety Management.
- BA shall comply with all statutory requirements like applicable acts, regulations, codes of practice, OHSAS Standards, Labour laws, etc.
- BA shall abide by Safety manuals and guidelines of Discom issued from time to time.
- BA shall ensure safety training and induction program for the employees. The BA employees must carry safety training card / competency card to the worksite and produce the card on demand.
- All BA employees must be given valid ID card issued by BA cell of Discom who will check statutory compliances before issuing ID cards.
- BA shall not engage new workman without training and issue of ID card.
- PSS operator shall not be involved in maintenance activities.
- BA shall conduct safety audits & inspections as per Discom procedures.
- BA shall provide proper PPEs as per CSM F-8 ensure periodic inspection of PPE, Tools and tackles to ensure their serviceability.
- The BA shall participate in Safety promotional activities like celebration of Lineman day on 4th March, National Fire Service Day on 14th April and Theme based safety campaigns undertaken by the Discoms every month.
- BA to ensure that all LT complaints are routed through Call Centre and recorded in FCC. Rectification of fault shall be done only after call centre logging and with the knowledge of BA supervisor.
- No one will work alone or unsafely under public pressure or otherwise.
- BA shall ensure the adherence to standard operating procedures or guidelines laid down by the Discoms.
- BA shall ensure that no job shall be carried out without efficient supervision.
- BA shall ensure reporting of any unsafe act, unsafe conditions, near miss, incident, or accident to engineer in-charge and SAFETY team of the Discom.
- BA shall provide safety performance and Safety MIS to engineer in-charge and Discom SAFETY group periodically. Based on any non-confirmation to the safety procedures and guidelines, BA is liable to be negatively marked for his performance and suitable penalty will be imposed.
- BA safety staff shall work as per the guidance of the Discom safety department and functionally report Safety Head of Discom. Any leaves by safety staff of the BA shall have to approved by Discom Safety Department.
- BA shall ensure to depute Safety Staff - One safety supervisor per section, One safety engineer per sub-division and one safety manager per Division Safety manager and Safety engineer must be having PDIS or ADIS.



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12.3 Safety Conditions for the major contract work in Civil Projects:

A BA awarded a major contract work of / in civil project will be required to fulfil the following safety conditions:

- BA shall provide Safety Policy, Safety Objectives, Organogram showing structure and responsibility of Safety management of his company and shall document the work practices and procedures in terms of Safety Management.
- BA shall comply with all statutory requirements like applicable acts, regulations, codes of practice, OHSAS Standards, Labour laws, etc.
- BA shall abide by Safety manuals and guidelines of Discom issued from time to time.
- BA shall ensure safety training and induction program for the employees. The BA employees must carry safety training card / competency card to the worksite and produce the card on demand.
- All BA employees must be given valid ID card issued by BA cell of Discom who will check statutory compliances before issuing ID cards.
- BA shall not employ a new workman without training and issue of ID card.
- BA shall conduct safety audits & inspections as per Discom procedures.
- BA shall provide proper PPEs as per CSM F-8 ensure periodic inspection of PPE, Tools and tackles to ensure their serviceability.
- BA shall ensure the adherence to standard operating procedures or guidelines laid down by the Discoms.
- BA shall ensure that no job shall be carried out without efficient supervision.
- BA shall ensure reporting of any unsafe act, unsafe conditions, near miss, incident, or accident to engineer in-charge and SAFETY team of the Discom.
- The BA shall participate in Safety promotional activities like celebration of Lineman day on 4th March, National Fire Service Day on 14th April and Theme based safety campaigns undertaken by the Discoms every month.
- BA shall provide safety performance and Safety MIS to engineer in-charge and Discom SAFETY group periodically. Based on any non-confirmation to the safety procedures and guidelines, BA is liable to be negatively marked for his performance and suitable penalty will be imposed.
- BA safety staff shall work as per the guidance of the Discom safety department and functionally report Safety Head of Discom. Any leaves by safety staff of the BA shall have to approved by Discom Safety Department.
- BA shall refer Construction Safety Manual of the Discom for details.
- BA shall ensure to depute a Safety Supervisor (for workforce up to 100 at site) / a safety engineer (for workforce up to 250 at site) / safety manager (for more than two safety engineers) for managing safety at the project site. In case the BA has been awarded more than one major contracts, then the following safety structure will be adopted.
- Safety Engineers and Safety Managers must be having PDIS or ADIS.

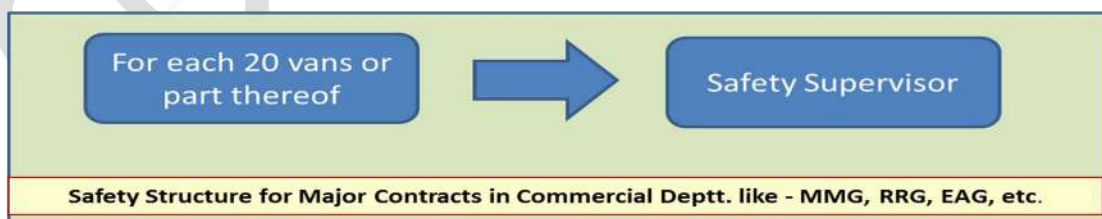


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12.4 Safety Conditions for the major contract work in Commercial Department like - MMG, RRG, EAG, etc.:

A BA awarded a major contract work in meter management group & energy auditing group will be required to fulfil the following safety conditions:

- BA shall provide Safety Policy, Safety Objectives, Organogram showing structure and responsibility of Safety management of his company and shall document the work practices and procedures in terms of Safety Management.
- BA shall comply with all statutory requirements like applicable acts, regulations, codes of practice, OHSAS Standards, Labour laws, etc.
- BA shall abide by Safety manuals and guidelines of Discom issued from time to time.
- BA shall ensure safety training and induction program for the employees. The BA employees must carry safety training card / competency card to the worksite and produce the card on demand.
- All BA employees must be given valid ID card issued by BA cell of Discom who will check statutory compliances before issuing ID cards.
- BA shall not employ a new workman without training and issue of ID card.
- BA shall conduct safety audits & inspections as per Discom procedures.
- The BA shall participate in Safety promotional activities like celebration of Lineman day on 4th March, National Fire Service Day on 14th April and Theme based safety campaigns undertaken by the Discoms every month.
- BA shall provide proper PPEs as per CSM F-8 ensure periodic inspection of PPE, Tools and tackles to ensure their serviceability.
- BA shall ensure the adherence to standard operating procedures or guidelines laid down by the Discoms.
- BA shall ensure that no job shall be carried out without efficient supervision.
- BA shall ensure reporting of any unsafe act, unsafe conditions, near miss, incident, or accident to engineer in-charge and SAFETY team of the Discom.
- BA shall provide safety performance and Safety MIS to engineer in-charge and Discom SAFETY group periodically. Based on any non-confirmation to the safety procedures and guidelines, BA is liable to be negatively marked for his performance and suitable penalty will be imposed.
- BA safety staff shall work as per the guidance of the Discom safety department and functionally report Safety Head of Discom. Any leaves by safety staff of the BA shall have to approved by Discom Safety Department.
- BA shall ensure to depute a Safety Supervisor for managing safety at worksite.
- The BA for the RRG work shall depute one Safety supervisor.

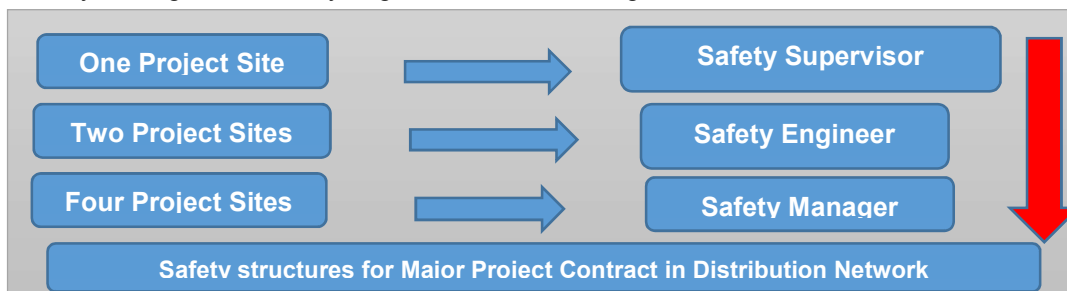


12.5 Safety Conditions for Major Projects in Distribution Network

A BA awarded a major Projects in Distribution Network shall be required to fulfil the following conditions:

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- Availability of Discharge Rods - Minimum 6 Nos. for each project site, fit for purpose and in good conditions and defective rods are removed from service.
- Availability of Neon tester - Minimum one Neon Tester in each project site, in good and working condition and defective or non-standard neon testers are removed from service.
- Electrical hand Gloves - Minimum one sets of 33 KV, 11 KV and LT in each project site.
- The BA linemen must be having required ELBO certification for the voltage level involved.
- BA shall provide Safety Policy, Safety Objectives, Organogram showing structure and responsibility of Safety management of his company and shall document the work practices and procedures in terms of Safety Management.
- BA shall comply with all statutory requirements like applicable acts, regulations, codes of practice, OHSAS Standards, Labour laws, etc.
- BA shall abide by Safety manuals and guidelines of Discom issued from time to time.
- BA shall ensure safety training and induction program for the employees. The BA employees must carry safety training card / competency card to the worksite and produce the card on demand.
- The BA shall participate in Safety promotional activities like celebration of Lineman day on 4th March, National Fire Service Day on 14th April and Theme based safety campaigns undertaken by the Discoms every month.
- All BA employees must be given valid ID card issued by BA cell of Discom who will check statutory compliances before issuing ID cards.
- BA shall not employ a new workman without training and issue of ID card.
- BA shall conduct safety audits & inspections as per Discom procedures.
- BA shall provide proper PPEs as per CSM F-8 ensure periodic inspection of PPE, Tools and tackles to ensure their serviceability.
- BA shall ensure the adherence to standard operating procedures or guidelines laid down by the Discoms.
- BA shall ensure that no job shall be carried out without efficient supervision.
- BA shall ensure reporting of any unsafe act, unsafe conditions, near miss, incident, or accident to engineer in-charge and SAFETY team of the Discom.
- BA shall provide safety performance and Safety MIS to engineer in-charge and Discom SAFETY group periodically. Based on any non-confirmation to the safety procedures and guidelines, BA is liable to be negatively marked for his performance and suitable penalty will be imposed.
- The BA shall participate in Safety promotional activities like celebration of Lineman day on 4th March, National Fire Service Day on 14th April and Theme based safety campaigns undertaken by the Discoms every month.
- BA safety staff shall work as per the guidance of the Discom safety department and functionally report Safety Head of Discom. Any leaves by safety staff of the BA shall have to approved by Discom Safety Department.
- BA shall ensure to depute Safety Staff for managing safety in worksites. One safety supervisor per project site or 100 persons, one safety engineer for 2 project sites of 250 persons, and one safety manager for four project sites or 500 persons.
- Safety manager and Safety engineer must be having PDIS or ADIS.



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CONFIDENTIAL

CORPORATE ENVIRONMENT POLICY

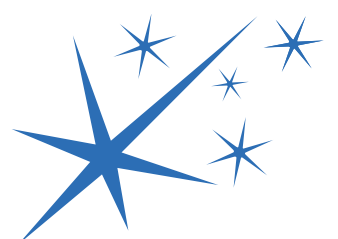
Tata Power is committed to a clean, safe and healthy environment, and we shall operate our facilities in an environmentally sensitive and responsible manner. Our commitment to environmental protection and stewardship will be achieved by:

- Complying with the requirements and spirit of applicable environmental laws and striving to exceed required levels of compliance wherever feasible
- Ensuring that our employees are trained to acquire the necessary skills to meet environmental standards
- Conserving natural resources by improving efficiency and reducing wastage
- Making business decisions that aim towards sustainable development
- Engaging with stakeholders to create awareness on sustainability



(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

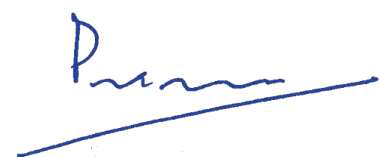


HEALTH AND SAFETY POLICY

We, at Tata Power, reaffirm our belief that the health and safety of our stakeholders is of the utmost importance and takes precedence in all our business decisions. In pursuit of this belief and commitment, we strive to:

- Maintain and proactively improve our management systems to minimize health and safety hazards to our stakeholders and all others influenced by our activities.
- Comply and endeavour to exceed all applicable occupational health & safety legal and other requirements by setting the highest standards.
- Integrate health & safety procedures and best practices into every operational activity with assigned line-functional responsibilities at all levels, for improving and sustaining health & safety performance.
- Involve our employees in maintaining a safe and healthy work environment through risk assessments, periodic reviews of operational procedures, safe work methods and adoption of new technology.
- Develop a culture of safety through active leadership and provide appropriate training at all levels to enable employees developing their skills to work safely.
- Incorporate appropriate health & safety criteria into business decisions for selection of plant and technology, performance appraisal of individuals and appointments in key positions.
- Ensure availability at all times of appropriate resources to fully implement the health & safety policy of the company.
- Promptly report incidents, investigate for root causes and ensure lessons learnt shared and deployed across the company.
- Ensure service providers and their workmen align with company's safety codes and practices for the health and safety of personnel working with us.
- Set safety & health metrics as indicators of excellence, monitor progress and continually improve performance.

We shall actively communicate this policy to all stakeholders by suitable means and periodically review its relevance in continuously changing business environment.

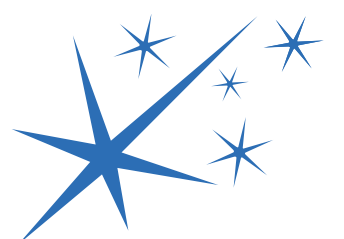


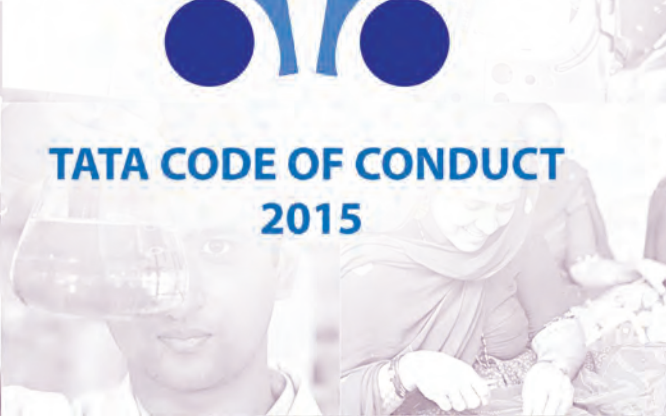
(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

TATA POWER

Lighting up Lives!





TATA CODE OF CONDUCT 2015



LEADERSHIP THAT INSPIRES

For over 100 years, the Tata group has been led by visionaries who have stayed true to the vision of the founder, Jamsetji Tata.

A vision that placed the greater good of society at par with business growth.

A vision that put into practice pioneering social initiatives that changed the way responsible business was run.

And a vision that brought into the group a strong social conscience.



We do not claim to be more unselfish, more generous or more philanthropic than other people. But we think we started on sound and straightforward business principles, considering the interests of the shareholders our own, and the health and welfare of the employees, the sure foundation of our success.

Jamsetji Tata
Founder of the Tata group
Chairman (1868 – 1904)

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FOREWORD

Tata companies have consistently adhered to the values and ideals articulated by the Founder for over 150 years. The Tata Code of Conduct was first formalized by Mr Ratan Tata. It articulates the Group's values and ideals that guide and govern the conduct of our companies as well as our colleagues in all matters relating to business. Today, the Code is a bedrock on which we base our individual, as well as leadership commitments to core Tata values.

The Tata Code of Conduct outlines our commitment to each of our stakeholders, including the communities in which we operate, and is our guiding light when we are sometimes faced with business dilemmas that leave us at ethical crossroads. The Code is also dynamic in that it has been periodically refreshed in order to remain contemporary and contextual to the changes in law and regulations. However it remains unaltered at its core.

Our stellar reputation and success as a business entity has been defined by the powerful commitment and adherence to the core values and principles expressed in this Code, by all our employees, directors and partners. I trust every Tata colleague and Tata company will continue to not only comply with the laws and regulations that govern our business interests around the world, but will continue to set new standards of ethical conduct that will generate deep respect and inspire emulation by others.

N. Chandrasekaran

21st February, 2017



A. OUR VALUES

TATA has always been values-driven. The five core values that underpin the way we conduct our business activities are:



These universal values serve as the foundation for the Tata Code of Conduct. They find expression within the value system of every Tata company.

B. SCOPE AND PURPOSE OF THIS CODE

1. This Code sets out how we behave with:
 - our employees, or those who work with us;
 - our customers;
 - the communities and the environment in which we operate;
 - our value-chain partners, including suppliers and service providers, distributors, sales representatives, contractors, channel partners, consultants, intermediaries and agents;
 - our joint-venture partners or other business associates;
 - our financial stakeholders;
 - the governments of the countries in which we operate; and
 - our group companies.
2. In this Code, “we or us” means our company, our executive directors, officers, employees and those who work with us, as the context may require.
3. The term “our group companies” in this Code typically means companies Tata Sons intends for this Code to apply to, and / or to whom Tata Sons has issued this Code.
4. This Code sets out our expectations of all those who work with us. We also expect those who deal with us to be aware that this Code underpins everything we do, and in order to work with us they need to act in a manner consistent with it.

REMEMBER...

It is our commitment to protect our reputation and our brand equity by adhering to the values and principles set out in this Code. By doing so, we strengthen our unique culture and identity.

OUR CORE PRINCIPLES



The Tata philosophy of management has always been, and is today more than ever, that corporate enterprises must be managed not merely in the interests of their owners, but equally in those of their employees, of the consumers of their products, of the local community and finally of the country as a whole.

J.R.D. Tata

Chairman, Tata Sons (1938 – 1991)

C. OUR CORE PRINCIPLES

1. We are committed to operating our businesses conforming to the highest moral and ethical standards. We do not tolerate bribery or corruption in any form. This commitment underpins everything that we do.
2. We are committed to good corporate citizenship. We treat social development activities which benefit the communities in which we operate as an integral part of our business plan.
3. We seek to contribute to the economic development of the communities of the countries and regions we operate in, while respecting their culture, norms and heritage. We seek to avoid any project or activity that is detrimental to the wider interests of the communities in which we operate.
4. We shall not compromise safety in the pursuit of commercial advantage. We shall strive to provide a safe, healthy and clean working environment for our employees and all those who work with us.
5. When representing our company, we shall act with professionalism, honesty and integrity, and conform to the highest moral and ethical standards. In the countries we operate in, we shall exhibit culturally appropriate behaviour. Our conduct shall be fair and transparent and be perceived as fair and transparent by third parties.
6. We shall respect the human rights and dignity of all our stakeholders.
7. We shall strive to balance the interests of our stakeholders, treating each of them fairly and avoiding unfair discrimination of any kind.
8. The statements that we make to our stakeholders shall be truthful and made in good faith.
9. We shall not engage in any restrictive or unfair trade practices.
10. We shall provide avenues for our stakeholders to raise concerns or queries in good faith, or report instances of actual or perceived violations of our Code.
11. We shall strive to create an environment free from fear of retribution to deal with concerns that are raised or cases reported in good faith. No one shall be punished or made to suffer for raising concerns or making disclosures in good faith or in the public interest.
12. We expect the leaders of our businesses to demonstrate their commitment to the ethical standards set out in this Code through their own behaviour and by establishing appropriate processes within their companies.
13. We shall comply with the laws of the countries in which we operate and any other laws which apply to us. With regard to those provisions of the Code that are explicitly dealt with under an applicable law or employment terms, the law and those terms shall take precedence. In the event that the standards prescribed under any applicable law are lower than that of the Code, we shall conduct ourselves as per the provisions of the Code.

REMEMBER...

"Good faith" means having a reasonable belief that the information you have provided is truthful. It does not mean having 'all the evidence' about the potential violation or case reported.

OUR EMPLOYEES



Once you got the best people, the people who shared our values and ideals, we left them free to act on their own. We do not fetter them. We encourage them and give them opportunities for leadership.

J.R.D. Tata

Chairman, Tata Sons (1938 – 1991)

D. OUR EMPLOYEES

Equal opportunity employer

1. We provide equal opportunities to all our employees and to all eligible applicants for employment in our company. We do not unfairly discriminate on any ground, including race, caste, religion, colour, ancestry, marital status, gender, sexual orientation, age, nationality, ethnic origin, disability or any other category protected by applicable law.
2. When recruiting, developing and promoting our employees, our decisions will be based solely on performance, merit, competence and potential.
3. We shall have fair, transparent and clear employee policies which promote diversity and equality, in accordance with applicable law and other provisions of this Code. These policies shall provide for clear terms of employment, training, development and performance management.

Q&A

A job requirement entails extensive travel. One of the candidates has excellent relevant experience and qualifications. However, this candidate is a single parent. As a result, I feel such a situation would significantly hinder this candidate's ability to cope with the job requirement. What should I do?

In accordance with the Code, the decision to recruit an employee should be based upon merit. We cannot make a presumption that the candidate would not be able to meet the travel requirements of the job. All eligible candidates should be provided with equal opportunity to demonstrate or justify that they can cope with the travel requirements of the job. Being a single parent cannot be a ground to be discriminated against at any stage of recruitment or ongoing employment in our company.

REMEMBER...

We do not tolerate harassment in any form and therefore we expect every employee to discourage such misdemeanours in the workplace.

Dignity and respect

4. Our leaders shall be responsible for creating a conducive work environment built on tolerance, understanding, mutual cooperation and respect for individual privacy.
5. Everyone in our work environment must be treated with dignity and respect. We do not tolerate any form of harassment, whether sexual, physical, verbal or psychological.
6. We have clear and fair disciplinary procedures, which necessarily include an employee's right to be heard.
7. We respect our employees' right to privacy. We have no concern with their conduct outside our work environment, unless such conduct impairs their work performance, creates conflicts of interest or adversely affects our reputation or business interests.

Human rights

8. We do not employ children at our workplaces.
9. We do not use forced labour in any form. We do not confiscate personal documents of our employees, or force them to make any payment to us or to anyone else in order to secure employment with us, or to work with us.

Bribery and corruption

10. Our employees and those representing us, including agents and intermediaries, shall not, directly or indirectly, offer or receive any illegal or improper payments or comparable benefits that are intended or perceived to obtain undue favours for the conduct of our business.

REMEMBER...

Violation by even a single employee of any law relating to anti-bribery, anti-corruption, anti-competition, data privacy, etc. could result in severe financial penalties and cause irreparable reputational damage to the company.

Gifts and hospitality

11. Business gifts and hospitality are sometimes used in the normal course of business activity. However, if offers of gifts or hospitality (including entertainment or travel) are frequent or of substantial value, they may create the perception of, or an actual conflict of interest or an 'illicit payment'. Therefore, gifts and hospitality given or received should be modest in value and appropriate, and in compliance with our company's gifts and hospitality policy.

Freedom of association

12. We recognise that employees may be interested in joining associations or involving themselves in civic or public affairs in their personal capacities, provided such activities do not create an actual or potential conflict with the interests of our company. Our employees must notify and seek prior approval for any such activity as per the 'Conflicts of Interest' clause of this Code and in accordance with applicable company policies and law.

REMEMBER...

As a general rule, we may accept gifts or hospitality from a business associate, only if such a gift:

- has modest value and does not create a perception (or an implied obligation) that the giver is entitled to preferential treatment of any kind;
- would not influence, or appear to influence, our ability to act in the best interest of our company;
- would not embarrass our company or the giver if disclosed publicly.

The following gifts are never appropriate and should never be given or accepted:

- gifts of cash or gold or other precious metals, gems or stones;
- gifts that are prohibited under applicable law;
- gifts in the nature of a bribe, payoff, kickback or facilitation payment*;
- gifts that are prohibited by the gift giver's or recipient's organisation; and
- gifts in the form of services or other non-cash benefits (e.g. a promise of employment).

(*Facilitation payment is a payment made to secure or speed up routine legal government actions, such as issuing permits or releasing goods held in customs.)

Working outside employment with us

13. Taking employment, accepting a position of responsibility or running a business outside employment with our company, in your own time, with or without remuneration, could interfere with your ability to work effectively at our company or create conflicts of interest. Any such activity must not be with any customer, supplier, distributor or competitor of our company. Our employees must notify and seek prior approval for any such activity as per the 'Conflicts of Interest' clause of this Code and in accordance with applicable company policies and law.

Integrity of information and assets

14. Our employees shall not make any wilful omissions or material misrepresentation that would compromise the integrity of our records, internal or external communications and reports, including the financial statements.
15. Our employees and directors shall seek proper authorisation prior to disclosing company or business-related information, and such disclosures shall be made in accordance with our company's media and communication policy. This includes disclosures through any forum or media, including through social media.
16. Our employees shall ensure the integrity of personal data or information provided by them to our company. We shall safeguard the privacy of all such data or information given to us in accordance with applicable company policies or law.
17. Our employees shall respect and protect all confidential information and intellectual property of our company.
18. Our employees shall safeguard the confidentiality of all third party intellectual property and data. Our employees shall not misuse such intellectual property and data that comes into their possession and shall not share it with anyone, except in accordance with applicable company policies or law.
19. Our employees shall promptly report the loss, theft or destruction of any confidential information or intellectual property and data of our company or that of any third party.

Q&A

I am an accountant in the finance department of my company. Due to my artistic skills, I received an offer to pen cartoons for a children's publication for which I would receive compensation. I plan to undertake this activity during week-ends. What should I do before accepting this offer?

Before accepting the offer, you should ascertain whether the company policies and rules require you to make a disclosure to your supervisor so that the company may determine whether your undertaking this activity adversely affects our company's interests. On confirmation from the company that it does not do so, you would be free to take up the activity. It is also your duty to bring to the attention of the company whenever there is any change in the situation you have disclosed.

20. Our employees shall use all company assets, tangible and intangible, including computer and communication equipment, for the purpose for which they are provided and in order to conduct our business. Such assets shall not be misused. We shall establish processes to minimise the risk of fraud, and misappropriation or misuse of our assets.
21. We shall comply with all applicable anti-money laundering, anti-fraud and anti-corruption laws and we shall establish processes to check for and prevent any breaches of such laws.

Insider trading

22. Our employees must not indulge in any form of insider trading nor assist others, including immediate family, friends or business associates, to derive any benefit from access to and possession of price sensitive information that is not in the public domain. Such information would include information about our company, our group companies, our clients and our suppliers.

Q&A

Our company has recently announced the launch of a new business initiative. In connection with this, your friend who is a journalist with a leading business newspaper has asked you to provide some information that he could cover in his forthcoming article. He has promised not to quote you, or reveal your identity. Should you be giving him this information?

No. You should not be sharing information of this nature with the media, even if it is assured that the source would remain anonymous. Only authorised personnel in the company are permitted to speak to the media and provide information of this nature.

Our company has a “Use of Social Media” policy that lays down the “dos and don’ts” for use of social media even if you may access such media on your own time. Why is there such a policy?

External communication is a serious matter. It must be carefully managed because information put out with reference to our company or its businesses needs to be clear, truthful and not violate any undertakings we have given to other parties. In each business there are managers nominated to authorise and make different types of statements to the outside world. These managers should be consulted about any request for information you may receive or information you think we should give out.

In using social media, in particular blogs or social networking sites, you should exercise great caution while talking about our company or the business we do. It may feel like you are chatting with friends or expressing a personal opinion but even while doing so you cannot share any confidential information of our company.

REMEMBER...

We must respect the property rights of others by never misusing their assets, intellectual property or trade secrets, including the copying or downloading of unauthorised software, trademarks, copyrighted material or logos. We should never make unauthorised copies of computer software programs or use unlicensed personal software on company computers.

Prohibited drugs and substances

23. Use of prohibited drugs and substances creates genuine safety and other risks at our workplaces. We do not tolerate prohibited drugs and substances from being possessed, consumed or distributed at our workplaces, or in the course of company duties.

Conflicts of interest

24. Our employees and executive directors shall always act in the interest of our company and ensure that any business or personal association *including close personal relationships* which they may have, does not create a conflict of interest with their roles and duties in our company or the operations of our company. Further, our employees and executive directors shall not engage in any business, relationship or activity, which might conflict with the interest of our company or our group companies.

25. Should any actual or potential conflicts of interest arise, the concerned person must immediately report such conflicts and seek approvals as required by applicable law and company policy. The competent authority shall revert to the employee within a reasonable time as defined in our company's policy, so as to enable the concerned employee to take necessary action as advised to resolve or avoid the conflict in an expeditious manner.
26. In the case of all employees other than executive directors, the Chief Executive Officer / Managing Director shall be the competent authority, who in turn shall report such cases to the Board of Directors on a quarterly basis. In case of the Chief Executive Officer / Managing Director and executive directors, the Board of Directors of our company shall be the competent authority.

Q&A

You are responsible for maintaining our company's customer database. One of your friends is starting a business venture and requests you to share a few particulars from this database for marketing purposes of his business. He assures you that he would keep the data as well as his source confidential. Should you do so?

No. You should respect the confidentiality of customer information and not share any part of the database with any person without due authorisation.

You have access to revenue numbers of different business units of our company. While having a conversation with you over evening drinks, your friend enquires about the financial performance of our company. You do not share detailed information with your friend, but share approximate revenue figures. Is this conduct of yours correct?

No, it is not. You are not permitted to share financial information of our company with others who do not need to know this information. Financial information should always be safeguarded and disclosed only on a need-to-know basis after obtaining requisite approvals. Sharing of any price sensitive information that is not generally available with the public could also lead to violation of applicable insider trading laws.

27. Notwithstanding such or any other instance of conflict of interest that exists due to historical reasons, adequate and full disclosure by interested employees shall be made to our company's management. At the time of appointment in our company, our employees and executive directors shall make full disclosure to the competent authority, of any interest leading to an

actual or potential conflict that such persons or their immediate family (including parents, siblings, spouse, partner, children) or persons with whom they enjoy close personal relationships, may have in a family business or a company or firm that is a competitor, supplier, customer or distributor of, or has other business dealings with, our company.

REMEMBER...

A conflict of interest could be any known activity, transaction, relationship or service engaged in by an employee, his/her immediate family (including parents, siblings, spouse, partner, and children), relatives or a close personal relationship, which may cause concern (based upon an objective determination) that the employee could not or might not be able to fairly perform his/her duties to our company.

Examples of Potential Conflicts of Interest

A conflict of interest, actual or potential, arises where, directly or indirectly, an employee or executive director:

- (a) engages in a business, activity or relationship with anyone who is party to a transaction with our company;
- (b) is in a position to derive an improper benefit, personally or for any family member or for any person in a close personal relationship, by making or influencing decisions relating to any transaction;
- (c) conducts business on behalf of our company or is in a position to influence a decision with regard to our company's business with a supplier or customer where a relative of, or a person in close personal relationship with, an employee or executive director is a principal officer or representative, resulting in a personal benefit or a benefit to the relative;
- (d) is in a position to influence decisions with regard to award of benefits such as increase in salary or other remuneration, posting, promotion or recruitment of a relative or a person in close personal relationship employed in our company or any of our group companies;
- (e) undertakes an activity by which the interest of our company or our group companies can be compromised or defeated; or
- (f) does anything by which an independent judgement of our company's or our group companies' best interest cannot be exercised.

28. If there is a failure to make the required disclosure and our management becomes aware of an instance of conflict of interest that ought to have been disclosed by an employee or executive director, our management shall take a serious view of the

matter and consider suitable disciplinary action as per the terms of employment. In all such matters, we shall follow clear and fair disciplinary procedures, respecting the employee's right to be heard.

Examples of activities normally approved (post-disclosure) as per applicable company policy

Acceptance of a position of responsibility (whether for remuneration or otherwise) in the following cases would typically be permitted, provided the time commitments these demand do not disturb or distract from the employee's primary duties and responsibilities in our company, and are promptly disclosed to the relevant competent authority:

- (a) Directorships on the Boards of any of our group companies, joint ventures or associate companies.
- (b) Memberships/positions of responsibility in educational/professional bodies, where such association will promote the interests of our company.
- (c) Memberships or participation in government committees/bodies or organisations.

Q&A

You are in a relationship with a colleague who has been recently moved into your team and would now be reporting to you. What should you do?

Romantic or close personal relationships with another employee where a reporting relationship exists and one is responsible for evaluating the other's performance, is likely to create a conflict of interest. In such a situation, you would need to report the potential conflict to your supervisor.

Your company is submitting a proposal to a company in which you were previously employed. You have confidential information pertaining to your previous employer, which you believe will help your present employer in winning the contract. Should you share this information?

No. You should not share this information with your company since it relates to confidential information of a third party. Your company respects its employees' duty to protect confidential information that they may have relating to their previous employers.

You are the purchasing manager in the procurement department of your company. You receive an invitation from a supplier to attend a premier sporting event as her guest. This particular supplier is one of the vendors who has submitted a proposal for an open tender issued by your company. Should you accept the invitation?

No. You should not accept the invitation in this instance. Since you are in a key decision-making role for the tender, any unusual benefit that you receive could be perceived as an inducement that could compromise your objectivity.

OUR CUSTOMERS



We have continued to enjoy prosperity, even with adverse times to fight against. Our relations with all concerned are the most friendly. We have maintained the same character for straight-forward dealing with our constituents and customers. Our productions have continued to be of the same high quality, and therefore command the best reputation and realise the highest prices. ... I mention these facts only to point out that with honest and straight-forward business principles, close and careful attention to details, and the ability to take advantage of favourable opportunities and circumstances, there is a scope for success.

Jamsetji Tata

Founder of the Tata group
Chairman, Tata Sons (1868 – 1904)

E. OUR CUSTOMERS

Products and services

1. We are committed to supplying products and services of world-class quality that meet all applicable standards.
2. The products and services we offer shall comply with applicable laws, including product packaging, labelling and after-sales service obligations.
3. We shall market our products and services on their own merits and not make unfair or misleading statements about the products and services of our competitors.

Export controls and trade sanctions

4. We shall comply with all relevant export controls or trade sanctions in the course of our business.

Fair competition

5. We support the development and operation of competitive open markets and the liberalisation of trade and investment in each country and market in which we operate.
6. We shall not enter into any activity constituting anti-competitive behaviour such as abuse of market dominance, collusion, participation in cartels or inappropriate exchange of information with competitors.
7. We collect competitive information only in the normal course of business and obtain the same through legally permitted sources and means.

Dealings with customers

8. Our dealings with our customers shall be professional, fair and transparent.
9. We respect our customers' right to privacy in relation to their personal data. We shall safeguard our customers' personal data, in accordance with applicable law.

Q&A

You are the Regional Sales Manager of our company. You have become a member of an “informal group”, on an instant messaging service, whose members are the regional sales heads of our company’s competitors. The administrator of the group has requested an in-person meeting to informally discuss market conditions and brainstorm on “pricing strategy” from an industry perspective. What should you do?

Any meeting with competitors, especially to discuss “pricing strategy”, could be an attempt to promote an anti-competitive practice or manipulate prices. You should respond by declining this invitation and exiting the “informal group”. You should also report this incident to your supervisor and your Legal department.

You are attending a customer meeting with a colleague, and your colleague makes an untruthful statement about the company’s services. What should you do?

You should assist your colleague in correcting the inaccuracy during the meeting if possible. If this is not possible, raise the issue with your colleague after the meeting to enable him/her or the company to correct any misrepresentation made to the customer.

While working on a customer project, you receive a call from your colleague. He used to manage that customer account before you took over his role. He recalls that he had worked with the customer on developing a new ordering system which he thinks would be beneficial for another customer and requests you to send him the project details. What should you do?

You must not share this information without specific approval of the customer; you are not permitted to use a customer’s assets, including software, for another customer or for any personal use.

REMEMBER...

Striving for excellence in the standards of our work and in the quality of our goods and services is a core Tata value. It is the unwavering practice of this value that builds and sustains customer trust in our brand.

OUR COMMUNITIES AND THE ENVIRONMENT



In a free enterprise, the community is not just another shareholder in business but is in fact the very purpose of its existence.

Jamsetji Tata

Founder of the Tata group
Chairman, Tata Sons (1868 – 1904)

F. OUR COMMUNITIES AND THE ENVIRONMENT

Communities

1. We are committed to good corporate citizenship, and shall actively assist in the improvement of the quality of life of the people in the communities in which we operate.
2. We engage with the community and other stakeholders to minimise any adverse impact that our business operations may have on the local community and the environment.
3. We encourage our workforce to volunteer on projects that benefit the communities in which we operate, provided the principles of this Code, where applicable, and in particular the 'Conflicts of Interest' clause are followed.

The environment

4. In the production and sale of our products and services, we strive for environmental sustainability and comply with all applicable laws and regulations.
5. We seek to prevent the wasteful use of natural resources and are committed to improving the environment, particularly with regard to the emission of greenhouse gases, consumption of water and energy, and the management of waste and hazardous materials. We shall endeavour to offset the effect of climate change in our activities.

OUR VALUE-CHAIN PARTNERS



If we had done some of the things that some other groups have done, we would have been twice as big as we are today.
But we didn't, and I would not have it any other way.

J.R.D. Tata

Chairman, Tata Sons (1938 – 1991)

(on the pace of expansion of the Tata group in the 1960s and 70s)

G. OUR VALUE-CHAIN PARTNERS

1. We shall select our suppliers and service providers fairly and transparently.
2. We seek to work with suppliers and service providers who can demonstrate that they share similar values. We expect them to adopt ethical standards comparable to our own.
3. Our suppliers and service providers shall represent our company only with duly authorised written permission from our company. They are expected to abide by the Code in their interactions with, and on behalf of us, including respecting the confidentiality of information shared with them.
4. We shall ensure that any gifts or hospitality received from, or given to, our suppliers or service providers comply with our company's gifts and hospitality policy.
5. We respect our obligations on the use of third party intellectual property and data.

Q&A

You head the procurement function in our company. You have tight budgetary constraints for a project that you are working on. In order to complete the project within the targeted costs, you intend to request your supplier to provide you an exceptional discount on this project order on the understanding that you would "make it up to him" in future orders. Would you be violating the Code?

Yes, you would. Inducement in any form, including future benefits to the supplier, could compromise your ability to act objectively and in the best interests of the company and therefore must be avoided.

REMEMBER...

Our value-chain partners would include our suppliers and service providers, distributors, sales representatives, contractors, channel partners, consultants, intermediaries and agents; joint-venture partners and other business associates.

OUR FINANCIAL STAKEHOLDERS



Ethical behaviour in business – in every sphere and with all constituents – has been the bedrock on which the Tata group has built, and operates, its enterprises. This has been an article of faith for the group ever since its inception, a fundamental element of our cherished heritage and the essence of our way of life.

Ratan Tata

Chairman, Tata Sons (1991 – 2012)

H. OUR FINANCIAL STAKEHOLDERS

1. We are committed to enhancing shareholder value and complying with laws and regulations that govern shareholder rights.
 2. We shall inform our financial stakeholders about relevant aspects of our business in a fair, accurate and timely manner and shall disclose such information in accordance with applicable law and agreements.
 3. We shall keep accurate records of our activities and shall adhere to disclosure standards in accordance with applicable law and industry standards.
-

GOVERNMENTS



Business, as I have seen it, places one great demand on you; it needs you to impose a framework of ethics, values, fairness and objectivity on yourself at all times. It is not easy to do this; you cannot impose it on yourself forcibly because it has to become an integral part of you.

Ratan Tata

Chairman, Tata Sons (1991 – 2012)

I. GOVERNMENTS

Political non-alignment

1. We shall act in accordance with the constitution and governance systems of the countries in which we operate. We do not seek to influence the outcome of public elections, nor to undermine or alter any system of government. We do not support any specific political party or candidate for political office. Our conduct must preclude any activity that could be interpreted as mutual dependence/favour with any political body or person, and we do not offer or give any company funds or property or other resources as donations to any specific political party, candidate or campaign.

Any financial contributions considered by our Board of Directors in order to strengthen democratic forces through a clean electoral process shall be extended only through the Progressive Electoral Trust in India, or by a similar transparent, duly-authorised, non-discriminatory and non-discretionary vehicle outside India.

Government engagement

2. We engage with the government and regulators in a constructive manner in order to promote good governance. We conduct our interactions with them in a manner consistent with our Code.
3. We do not impede, obstruct or improperly influence the conclusions of, or affect the integrity or availability of data or documents for any government review or investigation.

OUR GROUP COMPANIES



I do not think anyone was on par with Jamsetji as an industrial visionary. But that is not the sole reason why I have been an admirer of Jamsetji. The major reason was his sense of values, sterling values, which he imparted to this group. If someone were to ask me, what holds the Tata companies together, more than anything else, I would say it is our shared ideals and values which we have inherited from Jamsetji Tata.

J.R.D. Tata

Chairman, Tata Sons (1938 – 1991)

J. OUR GROUP COMPANIES

1. We seek to cooperate with our group companies, including joint ventures, by sharing knowledge, physical resources, human and management resources and adopting leading governance policies and practices in accordance with applicable law including adherence to competition law, where relevant.
2. We shall strive to achieve amicable resolution of any dispute between us and any of our group companies, through an appropriate dispute resolution mechanism so that it does not adversely affect our business interests and stakeholder value.
3. We shall have processes in place to ensure that no third party or joint venture uses the TATA name/brand to further its interests without proper authorisation.
4. Our Board of Directors shall consider for adoption policies and guidelines periodically formulated by Tata Sons and circulated to group companies.

Q&A

You are in the process of selecting potential vendors for an IT project in our company. In the final shortlist of two companies, one is a new start-up with limited references and a lower price-quotation, while the other is a Tata company with thirty years of implementation experience and good references, but a marginally higher quote for the same job. With all other parameters of choice being nearly equal, which company should you select for the job?

While price is undoubtedly an important criterion for decision making, it is clearly not the only one to be evaluated. You may also need to consider good customer references, proven track record and shared value systems in order to decide on your IT partner.

You are in the process of selecting potential vendors for a project. One of the three finalists is a group company. In reviewing the final proposals, you rank the group company second out of the three proposals based on pricing and total cost of ownership, and select the first-ranked vendor. Is this the right decision?

Yes. You should select the vendor that, on its own merits, is the vendor that is most appropriate for your company's requirements. You should not select a group company only because of its affiliation.

RAISING CONCERNS

We encourage our employees, customers, suppliers and other stakeholders to raise concerns or make disclosures when they become aware of any actual or potential violation of our Code, policies or law. We also encourage reporting of any event (actual or potential) of misconduct that is not reflective of our values and principles.

Avenues available for raising concerns or queries or reporting cases could include:

- immediate line manager or the Human Resources department of our company
- designated ethics officials of our company
- the 'confidential reporting' third party ethics helpline (if available)
- any other reporting channel set out in our company's 'Whistleblower' policy.

We do not tolerate any form of retaliation against anyone reporting legitimate concerns. Anyone involved in targeting such a person will be subject to disciplinary action.

If you suspect that you or someone you know has been subjected to retaliation for raising a concern or for reporting a case, we encourage you to promptly contact your line manager, the company's Ethics Counsellor, the Human Resources department, the MD/CEO or the office of the group's Chief Ethics Officer.

Q&A

My supervisor has asked me to do something which I believe may be illegal. I am afraid if I do not do what I am told, I could lose my job. Should I do it?

No. Breaking the law is never an option. Discuss the situation with your supervisor to be certain that you both understand the facts. If your concerns are not resolved, contact a higher level supervisor, the Ethics Counsellor, the Legal department or report them via the company's confidential reporting system, if available.

I feel that my supervisor is treating me unfairly for reporting a concern to the Ethics Counsellor. What should I do?

Retaliation against anyone who raises a concern is a violation of the Code. You should therefore promptly report this action of your supervisor to the Ethics Counsellor or the MD/CEO of your company or via the company's confidential reporting system, if available.

ACCOUNTABILITY

This Code is more than a set of prescriptive guidelines issued solely for the purpose of formal compliance. It represents our collective commitment to our value system and to our core principles.

Every person employed by us, directly or indirectly, should expect to be held accountable for his/her behaviour. Should such behaviour violate this Code,

they may be subject to action according to their employment terms and relevant company policies.

When followed in letter and in spirit, this Code is *'lived'* by our employees as well as those who work with us. It represents our shared responsibility to all our stakeholders, and our mutual commitment to each other.

SPEAK UP...

If you are unsure whether a particular action you are about to take is consistent with the principles set forth in the Code, ask yourself:

- Could it directly or indirectly endanger someone or cause them injury?
- Is it illegal/unlawful or out of line with our policies and procedures?
- Does my conscience reject it? Does it conflict with my personal values?
- Would I feel uncomfortable if the story appeared in the media? Would it shame my company, spouse, partner, parent or child?
- Does it 'feel' wrong?

If the answer to any of these questions is "Yes", please stop and consult your reporting manager, the Ethics Counsellor, the Human Resource department, the Legal department or any member of the senior management team, to assist you in making the decision.

When faced with a dilemma: Stop, Think, Act Responsibly

NOTE

The Code does not provide a comprehensive and complete explanation of all expectations from a company standpoint or obligations from a stakeholder standpoint.

Our employees have a continuing obligation to familiarise themselves with all applicable law, group-level advisories and policies, company-level policies, procedures and work rules as relevant. For any guidance on interpretation of the Code, we may seek support from our company's Ethics Counsellor or from the group's Chief Ethics Officer, as appropriate.

All joint ventures are encouraged to adopt the Tata Code of Conduct (TCOC) or a code of conduct that incorporates all elements of the TCOC.

This version of the Tata Code of Conduct supersedes all earlier versions and associated documents and stands effective from 29th July, 2015.

For any query or clarification on the Code, please contact the office of the group's Chief Ethics Officer via email at: ethicsoffice@tata.com.

TATA CODE OF CONDUCT – 2015

I acknowledge that I have received the Tata Code of Conduct.

I have read the Tata Code of Conduct and I acknowledge that as a Tata employee, I am required to comply with the guidelines described therein and failure to do so may subject me to action as per my employment terms and relevant company policies.

If I have a concern about a violation, or a potential violation of the Tata Code of Conduct, I understand that there are channels available to me in my company to report such concerns. By making use of these channels when necessary, I will play my part in maintaining the high ethical standards to which we hold ourselves.

Signature: _____

Date: _____

Name: _____

Department: _____

Address: _____

(Please submit this declaration to your Ethics Counsellor or the Human Resource department of your company.)



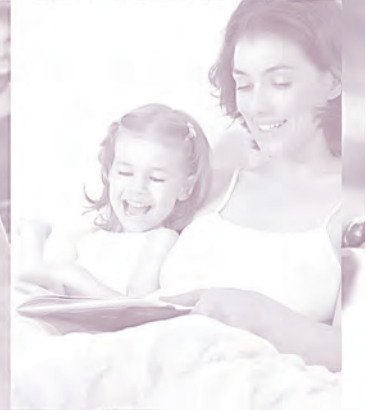


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For further information on the Code please contact:
The Ethics Office,
Tata Sons Ltd.,
Bombay House,
24, Homi Mody Street,
Mumbai – 400001, India.
Email: ethicsoffice@tata.com

The Tata Power Company Ltd

Undertaking by Vendor for Statutory Compliances

I undersigned,on behalf of M/s....."Name of Vendor Company"..... with "S&E registration no'.....having registered office at....."Address"..... confirm having received a Purchase Order from the Tata Power Company LTD to provide the services at theLocation..... In consideration of the purchase order and in view of the terms and conditions of purchase order, I declare and undertake the following:

- 1** I/ we have the valid registration Documents (*allotment letter issued by the authorities (EPFO & ESIC) are enclosed*):

Agreed	Not Applicable	Reason For Not Applicable
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- I. PF registration code
- II. ESIC registration code

- 2** I/we agree that for all the manpower engaged by me/us under this contract (direct or engaged through a subcontractor), we ensure that:

Agreed	Not Applicable	Reason For Not Applicable
--------	----------------	---------------------------

- I. Payment to all workers by 7th of every month for the salary / wages due for the preceding month through online Bank transfers and shall submit the wage register, pay slips, bank statement etc to "The Company".
- II. Minimum wages shall be paid to all the workers.
- III. PF & ESIC deposition and respective payment challan/ ECR shall be done on or before 12th of every month for the salary / wages for the preceding month and shall submit the copy of ECR & TRRN to "The Company".
- IV. General Employee Compensation under the Employee Compensation Act, 1928 shall be taken for those who are outside the wage limits of ESIC applicability or location where ESIC is not applicable.
- V. Statutory Bonus shall be paid on or before November every year.

- 3** I/ We understand that incase if we default on payment of salary of statutory dues for our manpower engaged by us under this contract (direct or engaged through a subcontractor), for a particular month, Tata Power constitutes the right to pay wages or deposit statutory dues directly adjusting from our bills and shall deduct or charge 25% penalty on the total amount defaulted.

Agreed	Not Applicable	Reason For Not Applicable
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- 4** I/we agree that for all the manpower deployed under this contract (direct or engaged through a subcontractor), we ensure that:

Agreed	Not Applicable	Reason For Not Applicable
--------	----------------	---------------------------

- I. Appointment letter and employment card will be issued to all either by us or through our sub-contractors. The copy of the appointment letter acknowledged by the employee and certified by us will be submitted to Tata Power within 1 month of joining.
- II. Full & Final settlement of the employee will be completed in 7 days of his/her last working day and a service completion letter to be issued, the acknowledge copy of both the documents (F&F settlement and Service certificate) by the employee and certified by us will be submitted to Tata Power.
- III. For our permanent staff, 4 (I) and 4 (II) is not applicable and we shall submit an undertaking either on mail / letterhead, with their names.

All the manpower are technically qualified as per the norms of **Power IV. Sector Skill Council (PSSC) issued by Ministry of Power- GOI dt January 2024. (copy enclosed)**

5	I/we shall mandatorily obtain the Labour License for all the manpower deployed under this contract (direct or engaged through subcontractor/s) to cater the entire work as per PO, if the overall number of manpower deployed under this contract exceeds the permissible limit under Contract Labour Act. The Form-V will be issued in name of my Company by Tata Power.	Agreed	Not Applicable	Reason For Not Applicable
6	I shall, in case for construction job, apply for registration under BOCW Act before start of work and obtain the said registration within a month of starting its work.	Agreed	Not Applicable	Reason For Not Applicable
7	For Clause no 6, I shall also make the payment of cess applicable under the BOCW Act for the work associated under this PO.	Agreed	Not Applicable	Reason For Not Applicable
8	I/ We understand & agree to adhere all the prevailing statutory compliances and any laws, rules & regulations which may get amended from time to time. We will be solely responsible for all the compliances including compliances by my sub-vendors & for all the workers.	Agreed	Not Applicable	Reason For Not Applicable
9	Following will be adhered:	Agreed	Not Applicable	Reason For Not Applicable

I. Medical fitness certificate and police verification certificate for all my workers for Gate pass process.

Indemnify "Tata Power" from any future liability of account of statutory compliance or failure on part of me for my work in "Tata Power" in respect of all the workers including my vendors & his workers, by submitting an Indemnity Bond on non judicial stamp paper (Rs 500 non judicial stamp paper for Maharashtra state and Rs 100 for all other states or as applicable) executed by its Director/Proprietor, authorized for the purpose, and duly notarized.

III. Maintain all registers under the various Acts and shall submit to "Tata Power" as and when required.

10	I shall depute competent resource/ supervisors to ensure supervision of work, follow proper disciplinary action for misconduct, ensuring availability of all resources required to execute the contract, ensuring good work culture and behaviour among my resources as framed under the provisions of law. I will also ensure engagement and R&R of my resources as required by "The Company".	Agreed	Not Applicable	Reason For Not Applicable
11	If "clause no 4 (iv)" is not adhered, then I will ensure compliance to capability building by training/upskilling of the workers as per the norms of Power Sector Skill Council (PSSC) through Tata Power Skill Development Institute (TPSDI) and will bare all the cost of training.	Agreed	Not Applicable	Reason For Not Applicable
12	I will make the provisions for canteen, sitting arrangement, rest rooms, washing facility, first Aid, drinking water and toilet facilities for my workers. I may consult with the order manager of "The Company".	Agreed	Not Applicable	Reason For Not Applicable
13	I will constitute the "Grievance Redressal Committee" to address the grievances of our workmen deployed under the contract.	Agreed	Not Applicable	Reason For Not Applicable

14	I shall comply, wherever applicable, to requirements under the Apprentices (Amendment) Act, 2014.	Agreed	Not Applicable	Reason For Not Applicable
15	I/ We understand that failure to adhere to the compliances and the timelines will attract penalties under the vendor penalty scheme attached as annexure 7 And it may lead to holding (fully or partially) of my payments of the bills.	Agreed	Not Applicable	Reason For Not Applicable
16	I shall ensure submission of required information to Tata Power ("The Company") as required by The Company or any government authorities (with a copy to "The Company"), as a when required within the stipulated time frame.	Agreed	Not Applicable	Reason For Not Applicable
17	I/ We understand that Tata Power constitutes the right to cancel the gate pass of any of our workman if the above conditions have not been fulfilled by us in the above mentioned stipulated time.	Agreed	Not Applicable	Reason For Not Applicable
18	Continuous default in compliance of any statutory provisions, for three months , may lead to termination of the contract and may also lead to blacklisting my vendors' registration with "The Company".	Agreed	Not Applicable	Reason For Not Applicable
19	In case any kind of work disruption is caused to the functioning of "The Company" due to agitation or tool down by my workmen (or workers of my sub-vendors), I will take appropriate disciplinary action including cancellation of gate pass of such worker/s as well as filing a FIR with the Police Authorities within 6 hours of the incidence. The details of the disciplinary actions undertaken will be submitted to "The Company" within 7 days of such incident.	Agreed	Not Applicable	Reason For Not Applicable
20	I have read & agree to abide the guidelines, rules etc as mentioned in the Annexures (Annexure 1 to 8) and the Guidelines of Central Electricity Authority – Ministry of Power.	Agreed	Not Applicable	Reason For Not Applicable

Date: _____

Signature: _____

Place: _____

Name: _____

Vendor code: _____

Witness :

For The Tata Power Company Limited:

Name & Signature:.....
(Head Corp Contracts)

Name & Signature:.....
(Head IR/ Head BHR)

Annexure 1

Onboarding of Vendor

1 I shall, before start of work, obtain and submit to “The Company” a copy of:

Agreed	Not Applicable	Reason For Not Applicable
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- I. PF Code allotment letter issued by the PF organization.
- II. ESIC Code allotment letter issued by the ESI authorities.
- III. Valid insurance documents (Policy) under Employees’ Compensation Act, for my employees who are not eligible for coverage under ESIC.
- IV. Copy of accepted Work Order received from “The Company”
- V. Indemnity Bond
- VI. ISM Bond
- VII. Copy of valid ISMW (if applicable)
Submit an application for obtaining Form-V required for applying for Labour License for all the manpower deployed under this contract (direct or engaged through subcontractor/s) to cater the entire work as per PO, if the overall number of manpower deployed under this contract exceeds the permissible limit under Contract Labour Act.
- VIII. I will submit a copy of valid Labour License along with other relevant documents with reference to the work order for catering the entire work, without which gate passes would not be issued to my employees.
- IX.

Annexure 2

Onboarding of Employees/ Manpower

1	I shall ensure safety training, medical check-up, police verification procedures for my employees (manpower deployed under this contract either direct or engaged through a subcontractor) as laid down for issue of gate-passes. I shall not engage any of my workers for work without a valid gate-pass or with a VISITOR GATE PASS. Violation of the above may lead to termination of the contract.	Agreed	Not Applicable	Reason For Not Applicable
2	Temporary permission is issued only for seven days only for preparing gate passes, hence I will be required to arrange for issuance of permanent gate-pass within said timeline, by submitting required documents/ information in online gate pass portal, as applicable. Under no circumstances shall temporary permission be issued for more than 7 days.	Agreed	Not Applicable	Reason For Not Applicable
	I will complete the process of medical fitness certificate and police verification certificate of all workers within these seven days and upload documents in ONLINE GATE PASS portal. If for any reason ONLINE GATE PASS portal is non-functional then application for gate pass will be processed through manual/other available system. I.			
3	Gate Passes to be processed through Online Gate Pass Portal only, as applicable. I will obtain required registration in Online Gate Pass Portal and required data and documents of workmen will be uploaded in ONLINE GATE PASS portal for generation of gate passes.	Agreed	Not Applicable	Reason For Not Applicable
4	I will facilitate transfer of PF/EPS accumulations in respect of my workers from their previous employer, if any.	Agreed	Not Applicable	Reason For Not Applicable
5	I will ensure to transfer of PF accumulations / updating KYC details of workers who will be engaged in the contract (if pending) by me within 02 months of starting of contract. Existing UAN to be continued and new UAN will not be generated.	Agreed	Not Applicable	Reason For Not Applicable
6	I will continue with existing ESI number for all covered workmen and shall complete KYC (if pending) and issue E-Pehchan card including dependents within 15 days of starting of contract.	Agreed	Not Applicable	Reason For Not Applicable

Annexure 3: Monthly compliances

- 1** I will submit all documents as per checklist to comply with the various statutes, statutory requirement or any other requirement as may be applicable from time to time:
- I.** I will submit details of Muster roll, Wage Register, Workmen Register in excel format.
 - II.** I shall submit the Register of Workmen in prescribed Form, duly filled in all respects, immediately after starting the said job.
 - III.** I will give Wage notification to my workmen at least one week ahead. A copy of the same shall be forwarded to "The Company" for necessary witnessing of payment and certification
 - IV.** I will provide Wage Slip (as per provided format) to all my workers before disbursement of wages.
 - V.** I shall disburse wages to all my employees before 7th of every subsequent month, of the previous month under intimation to "The Company" through bank transfer and shall submit a copy of bank statement to the respective compliance team of "The Company".
 - VI.** I will deposit PF contribution on or before 12th of the subsequent month for the previous month wages and submit proof thereof to "The Company" by 15th of the month.
 - VII.** I will deposit ESI contribution on or before 12th of the subsequent month for the previous month wages and submit proof thereof to "The Company" by 15th of the month
 - VIII.** I will submit all documents as per checklist; Muster roll, Wage Register, Bank statement, Adult Register, Workmen Register, Wage Slip copies, Combined Challan & ECR & TRRN of PF deposition and Challan/ Contribution History of ESIC/ Employee Compensation Policy and all other registers including MIS Reports (Excel sheet), Employee profile to "The Company"
 - IX.** I shall get my submitted statutory compliance documents verified before 15th of every month in prescribed format (checklist) provided by "The Company" and upload the same along with PF Challan & ESIC Challan with the invoice in Ariba System for obtaining statutory clearance on uploaded bills.

Agreed	Not Applicable	Reason For Not Applicable
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- 2** I understand that failure to adhere to the compliances and the timelines will lead to holding (fully or partially) of my payments of the bills.

Agreed	Not Applicable	Reason For Not Applicable
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Annexure 4

Renewal of Gate passes

- 1** In case of renewal of gate pass, I will initiate the application at least Fifteen days in advance in ONLINE GATE PASS portal.

Agreed	Not Applicable	Reason For Not Applicable
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Annexure 5

Annual Compliances

- 1** I will submit all relevant returns under all applicable enactments on or within the scheduled date and submit a copy of the same to “The Company” within seven days of the scheduled date of submission.

Agreed	Not Applicable	Reason For Not Applicable
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Annexure 6

Contract closure and/or F&F settlement

- 1** **After completion of work and before or at the time of submission of final bills,** I will ensure the following and submit proof thereof to “The Company” enabling “The Company” to release my final bills/invoices:

Agreed	Not Applicable	Reason For Not Applicable
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- I. All wage payments as per statute are made to all the workers (including subvendors) till the last day of their work in “The Company”.
- II. Compensation towards Leave with wages are disbursed to all the workers (including subvendors) till the last day of their work.
- III. Statutory bonus is paid to all the workers (including subvendors) for the period of their work.
- IV. Retrenchment compensation, if applicable, is paid to all the workers (including subvendors) as per eligibility. Notice is given to the workers regarding retrenchment and in absence of notice payment is given to the workers as per the enactment.
- V. Gratuity is paid to all the workers (including subvendors) irrespective of the fact whether the worker has /hasn't completed 5 years of continuous service with me.
- VI. Along with final payments, full & final statement is issued to all the workers engaged by me (including subvendors) for work in “The Company”.
- VII. No dues certificate obtained from all my employees (including subvendors) and copy submitted to “The Company”.
- VIII. Ensure completion of withdrawal or transfer formalities in respect of PF/EPS accumulation of all workers and submit proof thereof to “The Company” HR/IR dept after closure of contract.
- IX. Submit Form VI-A to “The Company” and surrender Labour License, if issued, to concerned Labour department in case the license is no more required for work in “The Company” and obtain clearance thereof from the Licensing Authority for submission to “The Company”.
- X. Ensure intimation to PF & ESI authorities regarding completion of work and surrendering ESI & PF sub code obtained for execution of work at “The Company”. Proof of the same will be submitted to “The Company”.
- XI. Cancel all gate passes in online gate pass portal & surrendering the access cards immediately upon closure of the said contract.

Annexure 7

Penalty scheme if defaulted in compliances:

I agree for the following penalty scheme which will be applicable if defaulted in compliances:

						Agreed	Not Applicable	Reason For Not Applicable
S N	Applicable Act	Compliance Requirement		Reference Annexure for Compliance Requirement	Due Date	Deduction as a % age of Monthly Bill Value		
1	CL (R&A) Act	a	Possessing Valid Labour License	Annexure 8 (4)	1 st day of work / Last day of existing license	5		
		b	Employment Card Issuance		1 st day of joining of worker	0.2		
2	CL (R&A) Act / Payment of Wages Act	a	Wage payment through Cheque/NEFT to 100% of Workmen	Annexure 8 (1)	7 th of following month	5		
		b	Wage Slip Distribution	Annexure 8 (4)	1 day before respective wage payment	1		
		c	Full & Final Settlement upon separation		30 days from last working day of individual worker	2		
3	EPF (MP) Act	a	Deposit of PF contribution	Annexure 8 (5)	15 th of following month	2		
		b	UAN Activation with mobile linkage		30 days from date of joining of worker	0.2		
4	ESI Act	a	Deposit of ESI contribution	Annexure 8 (6)	15 th of following month	2		
		b	ESIC & ESIC e-Pehchan Card Issuance		ESIC E-Pehchan Card- 01 days from Joining	0.2		
5	Payment of Bonus Act, MW Act, PoW Act, CL (R&A) Act	Submission of Return under Bonus Act, MW Act, PoW Act & CLR Act		Annexure 8	Bonus Act-31 st Dec MW Act- 31 st Jan Pow Act-31 st Jan CL (R&A) Act-31 st Jan/ 31 st July	0.5		
6	CL(R&A) Act, Factories Act, BOCW Act, EPF Act, ESI Act	Maintaining of registers/ challans under CLR Act, Factories Act,		Annexure 8	20 th of following month	0.5		
7	Other	a	Submission of false or fake documents			10		
		b	Disruption (Strike, Gate jam etc) caused to the functioning of "The Company" and Lack of disciplinary action on the worker/s.	Conducting the enquiry of the incident/s, preparing & submitting the report to Mgmt, filing of FIR in police station as & when required, taking action on the worker/s and concluding the disciplinary process. (clause 19)		10		
		c	Delay in submission of statutory documents, checklist etc			1		
		d	Non adherence to Gate pass, onboarding process	Annexure 1 and 2		1		
					TOTAL	40.6		

Annexure 8

List of few of the statutory requirements, not being exhaustive:

I/We understand & agree to abide by all the Statutory Acts, Rules, amendments in Acts/ rules & notifications which may get amended / applicable from time to time.

Following is the list of few of the statutory requirements, not being exhaustive, which I will be complying from time to time and as applicable:

1

I shall comply with all applicable provisions under **THE PAYMENT OF WAGES ACT, 1936**

- I will display a notice showing the day on which the wages are paid,
- I. notice containing abstract of this Act in English and the vernacular language.
- II. I will pay wages on or before 7th of every month.
- III. Pay wages to employee for the purpose of this Act by NEFT.
- I will maintain register giving particulars of - (a) Persons employed
- IV. (b) Work performed by the employees (c) Deductions made from the wages (d) Fines imposed (e) Receipts given (f) Any other particulars in such a form as may be prescribe.
- V. I will maintain a register in Form IV for all the amount of advances sanctioned and the re-payment made.

Agreed	Not Applicable	Reason For Not Applicable
Agreed	Not Applicable	Reason For Not Applicable
Agreed	Not Applicable	Reason For Not Applicable

2

I shall comply with all applicable provisions under **THE MINIMUM WAGES ACT, 1948**

- I will Pay minimum rates of wages to each employee as declared by the State Government by bank Transfer. I will follow the minimum wages circular by the Govt Authority/ Company as declared time to time.
- II. I will maintain a Muster Roll cum Wage Register in Form II.
- III. I will Provide one day as a weekly day of rest to each employee.
- IV. I will ensure that the normal working hour in a day does not exceed 9 hours for an adult.
- I will Fix working hours in such a way so as to provide atleast half and
- V. hour rest, ensuring that the continuous working hour, does not exceed 5 hours in a row.
- VI. I will provide a holiday for a period of 24 consecutive hours, from the time his shift ends.
- VII. I will pay extra wages @ double the ordinary rate of wages for extra hours working.
- VIII. I will maintain a hard bound Inspection Book and produce it to Inspecting Officer, when required by him.

Agreed	Not Applicable	Reason For Not Applicable
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- IX. I will preserve all the registers and records maintained for a period of 3 years from the date of last entry.
- X. I will provide payment for work on a day of rest at a rate not less than the overtime rate.

3 I shall comply with all applicable provisions under EQUAL REMUNERATION ACT, 1976

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will pay equal remuneration to men and women workers for same work or work of a similar nature.
- II. I shall maintain such registers and other documents in relation to the workers employed by me.

4 I shall comply with all applicable provisions under THE CONTRACT LABOUR (REGULATION AND ABOLITION) ACT, 1970

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will provide at least 1 first aid box for every 150 workers.
- II. I will pay wages on or before expiry of 7th day of each wage-period after the last day of wage period.
- III. I will ensure the presence of authorized representative of Principal Employer at the place and time of disbursement of wages by me to workmen.
- IV. I will display a notice at the work place showing: i) wage-period, ii) place of disbursement, and iii) time of disbursement.
- V. I will keep all the records and registers at office or within the radius of 3 kms. of establishment, maintain such records and registers legibly in English, Marathi or Hindi, preserve them for a tenure of 3 calendar years from date of last entry.
- VI. I will display the wage notice in English and Hindi or in Marathi at a conspicuous place containing the following particulars:- 1. wages, 2. working hours, 3. wage -period, 4. Date of payment of wages, 5. Name and address of the Inspector having jurisdiction, 6. Date of payment of unpaid wages.
- VII. I will submit annual return in Form XXV in duplicate to Registering Officer before 15th February following the end of the year.
- VIII. I will pay wages before the expiry of 1 working day from the day on which the employee is terminated.

5 I shall comply with all applicable provisions under THE EMPLOYEES PROVIDENT FUNDS AND MISCELLANEOUS PROVISIONS ACT, 1952

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will submit the statement within 7 days of the close of every month.
- II. I will deduct the employee's contribution paid towards Employees Provident Fund.
- III. I will submit the duly approved form 11 by the competent authority while claiming the exemption from the PF act for my workers. (**Not valid for the Exempted PF Trusts**).
- IV. I will submit the ECR, Challan, TRRN etc on or before 14th of each month.
- V. I will maintain an inspection note-book in such form as may be specified by the Commissioner.

6

I shall comply with all applicable provisions under **THE EMPLOYEES' STATE INSURANCE ACT, 1948 AND THE EMPLOYEES STATE INSURANCE (GENERAL) REGULATIONS, 1950 AND THE EMPLOYEES' STATE INSURANCE RULES, 1950**

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will preserve all the register maintained for a period of 5 years from the date of last entry therein.
- II. I will register on-line on the website of Employees State Insurance within 15 days of employing the required number of employees.
- III. I will obtain correct particular of employees as required in Form 1.
- IV. I will send the declaration forms enclosed with Temporary Identification Certificate and a return in Form 3 within 10 days of furnishing the particulars to the appropriate office of ESIC.
- V. I will deliver the Temporary Identification Certificate and a copy of Form 3 to the employee.
- VI. I will take a duly filled Form 1-A from the employee having signature/thumb-impression and send it to the authority within 10 days of being furnished.
- VII. I will enter the particulars of changes given by the employee in Form 2 and send it within 10 days to the appropriate office.
- VIII. I will furnish information as required in Form 10.
- IX. I will maintain an Accident Book in Form 11 and preserve it for 5 years from the date of last entry.
- X. I will send an accident report in Form 12 to the nearest local office and Insurance Medical Officer.
- XI. I will provide the proper first-aid and arrange proper transportation for obtaining aid and care as may be required.
- XII. I will produce the Inspection Book on demand to the Inspector or any other person authorized by him.
- XIII. I will immediately report the death of the workers to the local officer, in death case.
- XIV. I will ensure that the body of deceased employee is not disposed until it has been examined by an Insurance Medical Officer.
- XV. I will ensure that no employee is dismissed, discharged or otherwise punished at any time while he/she is in receipt of benefit for Sickness, maternity, Temporary Disablement; or i. is under medical treatment for sickness; or ii. is absent due to illness arising.

7

I shall comply with all applicable provisions under **THE EMPLOYEE'S COMPENSATION ACT, 1923**

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will pay compensation if personal injury is caused to an employee by accident arising out of and in course of his employment.
- II. In case of death of an employee, I will deposit with the Commissioner a sum of not less than five thousand rupees as funeral expenditure.
- III. I will pay compensation only by deposit with the Commissioner.
- IV. I will submit a statement to the Commissioner detailing the circumstances attending the death of the employee and indicating the grounds if he is not liable to pay compensation on account of death.

- V. I will under any other law required to give notice to any authority of any accident occurring on his premises shall send a report to the Commissioner giving the circumstances attending the death or serious bodily injury.

- VI. If directed under a notification then I shall send a return specifying the number of injuries in respect to which the compensation has been paid during the previous year along with the amount paid.

8

I shall comply with all applicable provisions under **THE PAYMENT OF BONUS ACT, 1965**

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will pay bonus to its employee's in an accounting year provided that an employee shall be entitled to bonus if he has worked for at least thirty working days in that year.

- II. I will pay at least minimum bonus which shall be 8.33 per cent of the salary or wage earned by the employee during the accounting year or seven thousand Five hundred rupees whichever is higher.

- III. I will prepare and maintain a register showing the computation of the allocable surplus.

- IV. I will prepare and maintain a register showing details of the amount of bonus due to each of the employees, the deductions and the amount actually disbursed.

- V. I will send an annual return to the Inspector.

9

I shall comply with all applicable provisions under **THE INTER-STATE MIGRANT WORKMEN (REGULATIONS OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1979**

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will make application (in triplicate) for grant of license under the Act.

- II. I will furnish such particulars to the specified authority in the State from which an Inter-State migrant workman is recruited and in the State in which such workman is employed.

- III. I will issue to every inter-State migrant workman, a pass book.

- IV. I will furnish return in respect to every Inter-State migrant workman who ceases to be employed.

- V. I will pay wages to each Inter-State migrant workman employed by me which cannot be less than the rate of wages paid by the principal employer to a workman in the lowest category directly employed by him or minimum rate of wages, whichever is higher.

- VI. I will issue service certificate on termination of employment to the migrant workman.

- VII. I will maintain displacement-cum-outward journey allowance sheet and return journey allowance register.

- VIII. I will maintain muster roll register and register of wages, register of deduction, fines and advances, maintain register of overtime.

- IX. I will display an abstract of the Act and the rules in such form as may be approved by the Deputy Chief Labour Commissioner.

- X. I will display Notices showing the rates of wages, names and addresses of the Inspectors having jurisdiction at the conspicuous places at the establishment and the work-site.

XI. I will submit half yearly return (in duplicate).

10

I shall comply with all applicable provisions under **THE PAYMENT OF GRATUITY ACT 1972**

Agreed	Not Applicable	Reason For Not Applicable
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- I. I will pay the due amount of gratuity **annually** to all the employees & maintain the records. The same will be shared with my employees & also with the employer during the bill submission in month of March.
- II. I will pay the due amount of gratuity within 30 days from the date it becomes payable to the employee, net amount not exceeding 10 lakhs; and intimate the payment done to the Controlling Authority.
- III. I will deposit the amount of gratuity payable with the Controlling Authority if the claimant is minor nominee/heir.
- IV. I will authorize an officer as a representative to receive the notices on behalf of company under the Act and Rules.
- V. I will obtain insurance for securing liability for payment towards gratuity from the Life Insurance Corporation of India or any other prescribed insure; as recommended in the notification.
- VI. I will pay the due amount of premium for renewal of insurance policy obtained for securing liability for payment of gratuity.
- VII. I will serve a notice of opening of the establishment in Form A to the Controlling Authority, within 30 days of the Act becoming applicable to the establishment.
- VIII. I will serve a notice of change in Form B to the Controlling Authority within 30 days of change in name, address, employer or nature of business.
- IX. I will serve notice in Form C to the Controlling Authority before 60 days of intended closure.
- X. I will display conspicuously a notice at or near the main entrance of the establishment in bold letters in English and in a language understood by the majority of the employees specifying the name of the officer with designation authorised by me to receive notices under the Act or the Rules.
- XI. I will keep nominations in safe custody.
- XII. I will verify the service particulars of the employee with the service details within 30 days of receipt.
- XIII. I will return duplicate copy of nomination form after obtaining receipt from the employee.
- XIV. I will deposit such amount with the Controlling Authority, payable to such employee.
- XV. I will send a notice in Form L to the applicant (employee/nominee/heir; as the case may be) within 15 days of receipt of the application specifying the amount of gratuity payable, fix a date for payment of it and forward a copy of the same to the Controlling Authority.
- XVI. I will send a notice in duplicate in Form M to the applicant (employee/nominee/heir) within 15 days of receipt of the application specifying the reason for inadmissibility and forward a copy of the same to the Controlling Authority.

XVII. I will display an abstract of the Act and the Rules at or near main entrance of the establishment, in English and in language understood by the majority of employees.

11	I shall comply with all applicable provisions under THE MATERNITY BENEFIT ACT, 1961	Agreed	Not Applicable	Reason For Not Applicable
	I will ensure not to make the woman employee do any work which is of an arduous nature or which involves long hours of standing or which in any way is likely to interfere with her pregnancy or the normal development of the foetus, or is likely to cause her miscarriage or otherwise to adversely affect her health; during the specified period. I. any way is likely to interfere with her pregnancy or the normal development of the foetus, or is likely to cause her miscarriage or otherwise to adversely affect her health; during the specified period. II. I will display the abstract of Rules in Form 9 in a conspicuous place in the language or languages of the locality. III. I will maintain a Maternity Benefit Register in Form 10. I will ensure not to: i) dismiss or discharge the women employee on account of absence during maternity period, ii) serve notice of discharge or dismissal on such a day that the notice will expire during such absence, iii) vary to her disadvantage any of the conditions of her service. IV. or dismissal on such a day that the notice will expire during such absence, iii) vary to her disadvantage any of the conditions of her service. V. I will give maternity leave for a period of 26 weeks.			
12	I shall comply with all applicable provisions under THE CHILD LABOUR (PROHIBITION AND REGULATION) ACT, 1986	Agreed	Not Applicable	Reason For Not Applicable
	I will ensure not to employ any child or permit to work in : i) occupations specified in Part A of the Schedule or ii) processes specified in Part B of the Schedule. I. occupations specified in Part A of the Schedule or ii) processes specified in Part B of the Schedule.			
13	I shall comply with all applicable provisions under THE FACTORIES ACT, 1948 AND THE RULES as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable
14	I shall comply with all applicable provisions under THE SHOPS AND ESTABLISHMENTS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT AND THE RULES as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable
15	I shall comply with all applicable provisions under THE WEEKLY HOLIDAYS ACT, 1942.	Agreed	Not Applicable	Reason For Not Applicable
16	I shall comply with all the applicable provisions under THE NATIONAL AND FESTIVAL HOLIDAY ACT	Agreed	Not Applicable	Reason For Not Applicable
	I will grant leave/ holiday with wages on following 3 days, i.e. 26th I. January (Republic Day), 15th August (Independence Day) and 2nd October (Gandhi Jayanti).			
17	I shall comply with all applicable provisions under THE BUILDING AND OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable

18	I shall comply with all applicable provisions under APPRENTICES ACT, 1961 , as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable
19	I shall comply with all applicable provisions under THE PRIVATE SECURITY GUARDS ACT AND THE RULES of the State, as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable

I. I have the licence issued by the Competent Authority.

20	I shall comply with all applicable provisions under LABOUR WELFARE FUND ACT AND THE RULES of the State, as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable
21	I shall comply with all applicable provisions under The EMPLOYMENT OF LOCAL CANDIDATES IN THE INDUSTRIES ACT AND THE RULES of the State, as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable
22	I shall comply with all applicable provisions under THE WORKMEN'S MINIMUM HOUSE RENT ALLOWANCE ACT AND THE RULES of the State, as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable
23	I shall comply with all applicable provisions under Motor Transport Workers Act 1961 AND THE RULES of the State, as & if applicable.	Agreed	Not Applicable	Reason For Not Applicable
24	I shall comply with all applicable provisions under THE MAHARASHTRA MATHADI, HAMAL AND OTHER MANUAL WORKERS (REGULATION OF EMPLOYMENT AND WELFARE) ACT, 1969.	Agreed	Not Applicable	Reason For Not Applicable

Date:_____

Signature:_____

Place:_____

Name:_____

Vendor code:_____

Witness :

For The Tata Power Company Limited:

Name & Signature:.....
(Head Corp Contracts)

Name & Signature:.....
(Head IR/ Head BHR)