STANDARD

TRANSMISSION SERVICE AGREEMENT

FOR

DEVELOPMENT AND OPERATION OF INTRA-STATE TRANSMISSION SYSTEM

FOR TRANSMISSION OF ELECTRICITY THROUGH TARIFF BASED COMPETITIVE BIDDING FOR

DEVELOPMENT OF INTRA-STATE TRANSMISSION WORK IN M.P. THROUGH TARIFF BASED COMPETITIVE BIDDING: PACKAGE - I

BETWEEN THE

……..

(LONG TERM TRANSMISSION CUSTOMER)

AND

MP POWER TRANSMISSION PACKAGE-I LIMITED

…….2021

CONTENTS

THIS TRANSMISISON SERVICE AGREEMENT (hereinafter referred to as “TSA” or “Agreement” or "the Agreement” or “this Agreement") is made on the ……. [Insert day] of……. [Insert month] of Two Thousand and…… [Insert Year]

BETWEEN:

Persons whose names, addresses and other details are provided in Schedule 10 of this Agreement (collectively and individually referred to as the “Long Term Transmission Customer”), which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as Party of the one part;

AND

MP Power Transmission Package-I Limited, incorporated under the Companies Act, 2013, having its registered office at Core-4, SCOPE Complex, 7, Lodhi Road, New Delhi – 110 003 (herein after referred to as “Transmission Service Provider” or “TSP” or “Licensee”, which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as Party of the other part;

(Each of the “Long Term Transmission Customer” and “TSP” are individually referred to as “Party” and collectively as the “Parties”)

AND WHEREAS:

A) In accordance with the Bidding Guidelines, the Bid Process Coordinator (hereinafter referred to as BPC) had initiated a competitive e-reverse bidding process through issue of RFP for selecting a Successful Bidder to build, own, operate and transfer the Project comprising of the Elements mentioned in Schedule 1 (hereinafter referred to as the Project)

B) Pursuant to the said e-reverse bidding process, the BPC has identified the Successful Bidder, who will be responsible to set up the Project on build, own, operate and transfer basis to provide Transmission Service in accordance with the terms of this Agreement and the Transmission License.

C) The Selected Bidder have submitted the Contract Performance Guarantee and acquired one hundred percent (100%) of the equity shareholding of MP Power Transmission Package-I Limited, along with all its related assets and liabilities in terms of the provisions of the Share Purchase Agreement.

D) The TSP has agreed to make an application for a Transmission License to the State Commission for setting up the Project on build, own, operate and transfer basis.

E) The TSP has further agreed to make an application to the State Commission for the adoption of the Transmission Charges under Section 63 of the Electricity Act, 2003, along with a certification from the Bid Evaluation Committee in accordance with the Bidding Guidelines issued by Ministry of Power, Government of India.

F) The TSP agrees to the terms and conditions of this Agreement, for making available the Intra-State transmission system and charge the Transmission Charges in accordance with the terms and conditions of this Agreement.

G) The payment of the Transmission Charges by the Long Term Transmission Customer to the Licensee shall be governed as per this Agreement.

H) The terms and conditions stipulated in the Transmission License issued by the State Commission to the TSP shall be applicable to this Agreement and the TSP agrees to comply with these terms and conditions. In case of inconsistency between the Transmission License terms & conditions and the conditions of this Agreement, the conditions stipulated in the Transmission License granted by the State Commission shall prevail.

NOW, THEREFORE, IN CONSIDERATION OF THE PREMISES AND MUTUAL AGREEMENTS, COVENANTS AND CONDITIONS SET FORTH HEREIN, IT IS HEREBY AGREED BY AND BETWEEN THE PARTIES HERETO AS FOLLOWS:

ARTICLE: 1

1 DEFINITIONS AND INTERPRETATIONS

1.1 Definitions:

1.1.1 The words / expressions used in this Agreement, unless as defined below or repugnant to the context, shall have the same meaning as assigned to them by the Electricity Act, 2003 and the rules or regulations framed there under including those issued / framed by the State Commission (as defined hereunder), as amended or re-enacted from time to time or the General Clauses Act, failing which it shall bear its ordinary English meaning.

The words/expressions when used in this Agreement shall have the respective meanings as specified below:

"Acquisition Price" shall have the same meaning as defined in the Share Purchase Agreement;

"Act" or **"Electricity Act"** or **"Electricity Act 2003"** shall mean the Electricity Act, 2003 and any amendments made to the same or any succeeding enactment thereof;

"Affiliate" shall mean a company that either directly or indirectly

i. controls or
ii. is controlled by or
iii. is under common control with

a Bidding Company (in the case of a single company) or a Member (in the case of a Consortium) and "**control**" means ownership by one entity of at least twenty six percent (26%) of the voting rights of the other entity;

"Availability" in relation to the Project or in relation to any Element of the Project, for a given period shall mean the time in hours during that period the Project is capable to transmit electricity at its Rated Voltage and shall be expressed in percentage of total hours in the given period and shall be calculated as per the procedure contained in Appendix II to III of Madhya Pradesh Electricity Regulatory Commission (Terms and Conditions for Determination of Transmission Tariff) (Revision-IV) Regulations, 2020, attached herewith in Schedule 6;

"Bid" shall mean technical bid and financial bid submitted by the Bidder, in response to the RFP, in accordance with the terms and conditions of the RFP;

"Bid Deadline" shall mean the last date and time for submission of the Bid in response to RFP, as specified in the RFP;

"Bidding Company" shall refer to such single company that has made a Response to RFP for the Project;

"Bidding Consortium / Consortium" shall refer to a group of companies that has collectively made a Response to RFP for the Project;

"Bid Documents" or **"Bidding Documents"** shall mean the RFP, along with all attachments thereto or clarifications thereof;

"Bidding Guidelines" shall mean the "Tariff Based Competitive Bidding Guidelines for Transmission Service" and "Guidelines for Encouraging Competition in Development of Transmission Projects" issued by Government of India, Ministry of Power under Section – 63 of the Electricity Act as amended from time to time;

"Bid Process Coordinator" or **"BPC"** shall mean a person or its authorized representative as notified by the Government of Madhya Pradesh, responsible for carrying out the process for selection of Bidder who will acquire Transmission Service Provider;

"Business Day" shall mean a day other than Sunday or a statutory holiday, on which the banks remain open for business in the State in which the Long Term Transmission Customer's registered office is located and the concerned TSP are located;

"CEA" shall mean the Central Electricity Authority constituted under Section -70 of the Electricity Act;

"Change in law" shall have the meaning ascribed thereto in Article 12;

"Commercial Operation Date" or **"COD"** shall mean the date as per Article 6.2;

"Central Commission" or **"CERC"** shall mean the Central Electricity Regulatory Commission referred to in sub-section (1) of Section 76 of the Electricity Act, 2003 or its successors and assigns;

"Central Government" or **"GOI"** shall mean the Government of India;

"Competent Court of Law" shall mean the Supreme Court or any High Court, or any tribunal or any similar judicial or quasi-judicial body in India that has jurisdiction to adjudicate upon issues relating to the Project;

"Connection Agreement" shall mean the agreement between the CTU or STU or any other concerned parties and the TSP, setting out the terms relating to the connection of the Project to the Inter-connection Facilities and use of the Inter State Transmission System/ Intra State Transmission System (as the case may be) as per the provisions of the IEGC/ State Grid Code, as the case may be;

"Consultation Period" shall mean the period of sixty (60) days or such longer period as the Parties may agree, commencing from the date of issue of a TSP's Preliminary Notice or a Long Term Transmission Customer's Preliminary Termination Notice, as provided in Article 13 of this Agreement, for consultation between the Parties to mitigate the consequence of the relevant event having regard to all the circumstances;

"Consents, Clearances and Permits" shall mean all authorizations, licenses, approvals, registrations, permits, waivers, privileges, acknowledgements, agreements, or concessions required to be obtained from or provided by any concerned authority for the development, execution and operation of Project including without any limitation for the construction, ownership, operation and maintenance of the Transmission Lines and/or sub-stations;

"Construction Period" shall mean the period from (and including) the Effective Date of the Transmission Service Agreement up to (but not including) the COD of the Element of the Project in relation to an Element and up to (but not including) the COD of the Project in relation to the Project;

"Contractors" shall mean the engineering, procurement, construction, operation & maintenance contractors, surveyors, advisors, consultants, designers, suppliers to the TSP and each of their respective sub-contractors (and each of their respective successors and permitted assigns) in their respective capacities as such;

"Contract Performance Guarantee" shall mean the irrevocable unconditional bank guarantee, submitted and to be submitted by the TSP or by the Selected Bidder on behalf of the TSP to the Long Term Transmission Customer from a bank mentioned in Annexure 17 of the RFP, in the form attached here to as Schedule 8, in accordance with Article 3 of this Agreement and which shall include the additional bank guarantee furnished by the TSP under this Agreement;

"Contract Year", for the purpose of payment of Transmission Charges, shall mean the period beginning on the COD, and ending on the immediately succeeding March 31 and thereafter each period of 12

months beginning on April 1 and ending on March 31 provided that the last Contract Year shall end on the last day of the term of the TSA;

"CTU" or **"Central Transmission Utility"** shall have same meaning as defined in the Electricity Act, 2003;

"Day" shall mean a day starting at 0000 hours and ending at 2400 hours;

"D/C" shall mean Double Circuit;

"Dispute" shall mean any dispute or difference of any kind between the Parties, in connection with or arising out of this Agreement including any issue on the interpretation and scope of the terms of this Agreement as provided in Article 16;

"Due Date" in relation to any Invoice shall mean the thirtieth (30th) day after the date on which any Invoice is received and duly acknowledged by the Long Term Transmission Customer (or, if that day is not a Business Day, the immediately following Business Day), and by such date, the Invoice is payable by the Long Term Transmission Customer;

"Effective Date" for the purposes of this Agreement, shall have the same meaning as per Article 2.1 of this Agreement;

"Electrical Inspector" shall mean a person appointed as such by the State Government under sub-section (1) of Section 162 of the Electricity Act 2003 and also includes Chief Electrical Inspector;

"Electricity Rules 2005" shall mean the rules framed pursuant to the Electricity Act 2003 and as amended from time to time;

"Element" shall mean each Transmission Line or each circuit of the Transmission Lines (where there are more than one circuit) or each bay of Sub-station or switching station or HVDC terminal or inverter station of the Project, including ICTs, Reactors, SVC, FSC, etc. forming part of the Intra-State Transmission System, which will be owned, operated and maintained by the concerned Licensee, and which has a separate Scheduled COD as per Schedule 2 of this Agreement and has a separate percentage for recovery of Transmission Charges on achieving COD as per Schedule 5 of this Agreement;

"Event of Default" shall mean the events as defined in Article 13 of this Agreement;

"Expiry Date" shall be the date which is thirty five (35) years from the COD of the Project;

"Financial Closure" shall mean the first Business Day on which funds are made available to the TSP pursuant to the Financing Agreements;

"Financially Evaluated Entity" shall mean the company which has been evaluated for the satisfaction of the financial requirement set forth in the RFP;

"Financing Agreements" shall mean the agreements pursuant to which the TSP is to finance the Project including the loan agreements, security documents, notes, indentures, security agreements, letters of credit and other documents, as may be amended, modified, or replaced from time to time, but without in anyway increasing the liabilities of the Long Term Transmission Customer;

"Financial Year" shall mean a period of twelve months at midnight Indian Standard Time (IST) between 1st April & 31st March;

"Force Majeure" and **"Force Majeure Event"** shall have the meaning assigned thereto in Article 11;

"Grid Code" / "IEGC" or **"State Grid Code"** shall mean the Grid Code specified by the Central Commission under clause (h) of sub-section (1) of Section 79 of the Electricity Act and/or the State Grid Code as specified by the concerned State Commission referred under clause (h) of sub-section (1) of Section 86 of the Electricity Act as applicable;

"Independent Engineer" shall mean an agency/ company, appointed by Long Term Transmission Customer in accordance with the Guidelines for Encouraging Competition in Development of Transmission Projects.

"Indian Governmental Instrumentality" shall mean Government of India, Government of any State in India or any ministry, department, board, authority, agency, corporation, commission under the direct or indirect control of Government of India or any State Government or both, any political sub-division of any of them including any court or CERC or MPERC or tribunal or judicial or quasi-judicial body in India but excluding the CTU, TSP and the Long Term Transmission Customer;

"Insurances" shall mean the insurance cover to be obtained and maintained by the TSP in accordance with Article 9 of this Agreement;

"Interconnection Facilities" shall mean the facilities as may be set up for transmission of electricity through the use of the Project, on either one or both side of generating station's / CTU's / STU's / ISTS Licensee's / Long Term Transmission Customer's substations (as the case may be)

which shall include, without limitation, all other transmission lines, gantries, sub-stations and associated equipments not forming part of the Project;

"Invoice" shall mean a Monthly Transmission Charges Invoice or Monthly Bill comprising the Monthly Transmission Charges, as per Schedule 4 hereof, a Supplementary Invoice or any other Invoice or Bill raised by any of the Parties;

"Licensee" shall be the TSP under this Agreement, consequent to having been awarded a Transmission License by the State Commission and shall be referred to as the TSP or the Licensee, as the context may require in this Agreement;

"Law" or "Laws" in relation to this Agreement, shall mean all laws including electricity laws in force in India and any statute, ordinance, rule, regulation, notification, order or code, or any interpretation of any of them by an Indian Governmental Instrumentality having force of law and shall include all rules, regulations, decisions and orders of the State Commission;

"Lead Member of the Bidding Consortium" or "Lead Member" shall mean a company who commits at least 26% equity stake in the Project, meets the technical requirement as specified in the RFP and so designated by other Member(s) in Bidding Consortium;

"Letter of Credit" or **"LC"** shall mean an unconditional, irrevocable, revolving Letter of Credit opened by the Long Term Transmission Customer in favour of the TSP with any scheduled bank;

"Lenders" means the banks, financial institutions, multilateral funding agencies, non banking financial companies registered with the Reserve Bank of India (RBI), insurance companies registered with the Insurance Regulatory & Development Authority (IRDA), pension funds regulated by the Pension Fund Regulatory & Development Authority (PFRDA),mutual funds registered with Securities & Exchange Board of India (SEBI), etc., including their successors and assigns, who have agreed on or before COD of the Project to provide the TSP with the debt financing described in the capital structure schedule, and any successor banks or financial institutions to whom their interests under the Financing Agreements may be transferred or assigned;

Provided that, such assignment or transfer shall not relieve the TSP of its obligations to the Long Term Transmission Customer under this

Agreement in any manner and shall also does not lead to an increase in the liability of the Long Term Transmission Customer;

"Lenders Representative" shall mean the person notified by the Lender(s) in writing as being the representative of the Lender(s) or the Security Trustee and such person may from time to time be replaced by the Lender(s) pursuant to the Financing Agreements by written notice to the TSP;

"Long Term Transmission Customer" shall have the meaning as described in MPERC (Terms & Conditions for Determination of Transmission Tariff) (Revision-IV), Regulations, 2020 as amended from time to time, and for the purpose of this Project, shall refer to the entities listed in Schedule 10 of this Agreement or any such other person who executes a Supplementary Agreement for availing transmission service as per the provisions of the TSA;

"Letter of Intent" or **"LOI"** shall have the same meaning as in the RFP;

"Member in a Bidding Consortium / Member" shall mean each company in the Bidding Consortium;

"Month" shall mean a period of thirty (30) days from (and excluding) the date of the event;

"Monthly Transmission Charges" for any Element of the Project, after COD of the Element till COD of the Project, and for the Project after COD of the Project, shall mean the amount of Transmission Charges as specified in Schedule 5 of this Agreement multiplied by no. of days in the relevant month and divided by no. of days in the year;

"National Load Despatch Centre" shall mean the centre established as per sub-section (1) of Section 26 of the Electricity Act 2003;

"Notification" shall mean any notification, issued in the Gazette of India;

"Operating Period" for any Element of the Project shall mean the period from (and including) the COD of such Element of the Project, up to (and including) the Expiry Date and for the Project, shall mean the period from (and including) the COD of the Project, up to (and including) the Expiry Date;

"Parent Company" shall mean an entity that holds at least twenty six percent (26%) of the paid - up equity capital directly or indirectly in the

Bidding Company or in the Member in a Bidding Consortium, as the case may be;

"Preliminary Termination Notice" shall mean a Long Term Transmission Customer's Preliminary Termination Notice as defined in Article 13 of this Agreement;

"Project" shall mean Development of Intra-State Transmission Work in M.P. through Tariff Based Competitive Bidding: PACKAGE – I, as detailed in Schedule 1 of this Agreement;

"**Project Assets**" shall mean all physical and other assets relating to and forming part of the Project including:

(a) rights over the Site for substations, ROW for transmission lines;

(b) tangible & intangible assets such as civil works and equipment including foundations, embankments, pavements, electrical systems, communication systems, relief centres, administrative offices, Sub-stations, software, tower and sub-stations designs etc;

(c) project facilities situated on the Site;

(d) all rights of the TSP under the project agreements;

(e) financial assets, such as receivables, security deposits etc;

(f) insurance proceeds; and

(g) Applicable Permits and authorisations relating to or in respect of the Transmission System;"

"Project Execution Plan" shall mean the plan referred to in Article 3.1.3(c) hereof;

"Prudent Utility Practices" shall mean the practices, methods and standards that are generally accepted internationally from time to time by electric transmission utilities for the purpose of ensuring the safe, efficient and economic design, construction, commissioning, operation, repair and maintenance of the Project and which practices, methods and standards shall be adjusted as necessary, to take account of:

(i) operation, repair and maintenance guidelines given by the manufacturers to be incorporated in the Project,

(ii) the requirements of Law, and

(iii) the physical conditions at the Site;

(iv) the safety of operating personnel and human beings;

"Rated Voltage" shall mean voltage at which the Transmission System is designed to operate or such lower voltage at which the line is charged, for the time being, in consultation with the State Transmission Utility;

"Rebate" shall have the meaning as ascribed to in Article 10.3 of this Agreement;

"RFP" shall mean Request For Proposal dated 31.12.2021 along with all schedules, annexures and RFP Project Documents attached thereto, issued by the BPC for tariff based competitive bidding process for selection of Bidder as TSP to execute the Project, including any modifications, amendments or alterations thereto;

"RFP Project Documents" shall mean the following documents to be entered into in respect of the Project, by the Parties to the respective agreements:

a. Transmission Service Agreement,

b. Share Purchase Agreement, and

c. Any other agreement as may be required;

"RLDC" shall mean the relevant Regional Load Dispatch Centre as defined in the Electricity Act, 2003, in the region(s) in which the Project is located;

"RPC" shall mean the relevant Regional Power Committee established by the Government of India for the specific Region(s) in accordance with the Electricity Act, 2003 for facilitating integrated operation of the Power System in that Region;

"Scheduled COD" in relation to an Element(s) shall mean the date(s) as mentioned in Schedule 2 as against such Element(s) and in relation to the Project, shall mean the date as mentioned in Schedule 2 as against such Project, subject to the provisions of Article 4.4 of this Agreement, or such date as may be mutually agreed among the Parties;

"Scheduled Outage" shall mean the final outage plan as approved by the RPC/ SLDC as per the provisions of the Grid Code;

"Selected Bid" shall mean the technical Bid and the Final Offer of the Selected Bidder submitted during e-reverse bidding, which shall be downloaded and attached in Schedule 7 on or prior to the Effective Date;

"Share Purchase Agreement" shall mean the agreement amongst REC Power Development and Consultancy Limited, MP Power Transmission Package-I Limited and the Successful Bidder for the purchase of one hundred (100%) per cent of the shareholding of the MP Power Transmission Package-I Limited for the Acquisition Price, by the Successful Bidder on the terms and conditions as contained therein;

"Site" in relation to a substation, switching station or HVDC terminal or inverter station, shall mean the land and other places upon which such station / terminal is to be established;

"SLDC" shall mean the State Load Despatch Centre established as per sub-section (1) of Section 31 of the Electricity Act 2003;

"State Commission" or **"MPERC"** shall mean the Madhya Pradesh Electricity Regulatory Commission referred to in sub-section (1) of section 82 of the Electricity Act, 2003 or its successors and assigns;

"State Government" shall mean the Government of Madhya Pradesh**;**

"STU" or **"State Transmission Utility"** shall be the Board or the Government company, specified as such by the State Government under sub-section (1) of Section 39 of the Electricity Act 2003;

"Successful Bidder" or **"Selected Bidder"** shall mean the Bidder selected pursuant to the RFP and who has to acquire one hundred percent (100%) equity shares of MP Power Transmission Package-I Limited, along with all its related assets and liabilities, which will be responsible as the TSP to establish the Project on build, own, operate and transfer basis as per the terms of the TSA and other RFP Project Documents;

"Supplementary Agreement" shall mean the agreement as annexed hereto in Schedule 11 of this Agreement;

"TSP's Preliminary Notice" shall mean a notice issued by the TSP in pursuant to the provisions of Article 13.3 of this Agreement;

"Target Availability" shall have the meaning as ascribed hereto in Article 8.2 of this Agreement;

“Technically Evaluated Entity” shall mean the company which has been evaluated for the satisfaction of the technical requirement set forth in RFP;

“Termination Notice” shall mean a Long Term Transmission Customer’s Termination Notice given by the Long Term Transmission Customer to the TSP pursuant to the provisions of Articles 3.3.2, 3.3.4, 4.4.2, 5.8, 13.2 and 13.3 of this Agreement for the termination of this Agreement;

“Term of Agreement” for the purposes of this Agreement shall have the meaning ascribed thereto in Article 2.2 of this Agreement;

“Transmission Charges” shall mean the Final Offer of the Selected Bidder during the e-reverse bidding and adopted by the State Commission, payable to the TSP by the Long Term Transmission Customer, as per provisions of TSA;

“Transmission License” shall mean the license granted by the State Commission in terms of the relevant regulations for grant of such license issued under the Electricity Act;

“Transmission Service” shall mean making the Project available as per the terms and conditions of this Agreement;

“Unscheduled Outage” shall mean an interruption resulting in reduction of the Availability of the Element(s) / Project (as the case may be) that is not a result of a Scheduled Outage or a Force Majeure Event.

“Ultimate Parent Company” shall mean an entity which owns at least twenty six percent (26%) equity in the Bidding Company or Member of a Consortium, (as the case may be) and in the Technically Evaluated Entity and / or Financially Evaluated Entity (as the case may be) and such Bidding Company or Member of a Consortium, (as the case may be) and the Technically Evaluated Entity and / or Financially Evaluated Entity (as the case may be) shall be under the direct control or indirectly under the common control of such entity;

1.2 Interpretation:

Save where the contrary is indicated, any reference in this Agreement to:

“Agreement" shall be construed as including a reference to its Schedules, Appendices and Annexures;

"Rupee", **"Rupees"** and **“Rs.”** shall denote lawful currency of India;

“crore” shall mean a reference to ten million (10,000,000) and a **“lakh”** shall mean a reference to one tenth of a million (1,00,000);

"encumbrance" shall be construed as a reference to a mortgage, charge, pledge, lien or other encumbrance securing any obligation of any person or any other type of preferential arrangement (including, without limitation, title transfer and retention arrangements) having a similar effect;

"holding company" of a company or corporation shall be construed as a reference to any company or corporation of which the other company or corporation is a subsidiary;

"indebtedness" shall be construed so as to include any obligation (whether incurred as principal or surety) for the payment or repayment of money, whether present or future, actual or contingent;

"person" shall have the meaning as defined in Section 2 (49) of the Act;

"subsidiary" of a company or corporation (the holding company) shall be construed as a reference to any company or corporation:

(i) which is controlled, directly or indirectly, by the holding company, or

(ii) more than half of the issued share capital of which is beneficially owned, directly or indirectly, by the holding company, or

(iii) which is a subsidiary of another subsidiary of the holding company,

for these purposes, a company or corporation shall be treated as being controlled by another if that other company or corporation is able to direct its affairs and/or to control the composition of its board of directors or equivalent body;

"winding-up", **"dissolution"**, **"insolvency"**, or **"reorganization"** in the context of a company or corporation shall have the same meaning as defined in the Companies Act, 1956/ Companies Act, 2013 (as the case may be).

1.2.1 Words importing the singular shall include the plural and vice versa.

1.2.2 This Agreement itself or any other agreement or document shall be construed as a reference to this or to such other agreement or document as it may have been, or may from time to time be, amended, varied, novated, replaced or supplemented.

1.2.3 A Law shall be construed as a reference to such Law including its amendments or re-enactments from time to time.

1.2.4 A time of day shall, save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time.

1.2.5 Different parts of this Agreement are to be taken as mutually explanatory and supplementary to each other and if there is any inconsistency between or among the parts of this Agreement, they shall be interpreted in a harmonious manner so as to give effect to each part.

1.2.6 The tables of contents and any headings or sub-headings in this Agreement have been inserted for ease of reference only and shall not affect the interpretation of this Agreement.

1.2.7 All interest payable under this Agreement shall accrue from day to day and be calculated on the basis of a year of three hundred and sixty five (365) days.

1.2.8 The words “hereof” or “herein”, if and when used in this Agreement shall mean a reference to this Agreement.

1.2.9 The contents of Schedule 7 shall be referred to for ascertaining accuracy and correctness of the representations made by the Selected Bidder in Article 17.2.1 hereof.

ARTICLE: 2

2 EFFECTIVENESS AND TERM OF AGREEMENT

2.1 Effective Date:

This Agreement shall be effective from later of the dates of the following events:

a. The Selected Bidder, on behalf of the TSP, has provided the Contract Performance Guarantee, as per terms of Article 3.1 of this Agreement; and

b. The Selected Bidder has acquired for the Acquisition Price, one hundred percent (100%) of the equity shareholding of REC Power Development and Consultancy Limited in MP Power Transmission Package-I Limited along with all its related assets and liabilities as per the provisions of the Share Purchase Agreement. and

c. The Agreement is executed and delivered by the Parties;

2.2 Term and Termination:

2.2.1 Subject to Article 2.2.3 and Article 2.4, this Agreement shall continue to be effective in relation to the Project until the Expiry Date, when it shall automatically terminate.

2.2.2 Post the Expiry Date of this Agreement, the TSP shall ensure transfer of Project Assets to an agency as decided by the Government of Madhya Pradesh at zero cost and free from any encumbrance and liability. The transfer shall be completed within 90 days of expiry of this Agreement failing which Government of Madhya Pradesh shall be entitled to take over the Project Assets Suo moto.

2.2.3 This Agreement shall terminate before the Expiry Date in accordance with Article 13 or Article 3.3.2 or Article 3.3.4.

2.3 Conditions prior to the expiry of the Transmission License

2.3.1 In order to continue the Project beyond the expiry of the Transmission License, the TSP shall be obligated to make an application to the State Commission at least two (2) years before the date of expiry of the Transmission License, seeking the State Commission’s approval for the extension of the term of the Transmission License up to the Expiry Date.

2.3.2 The TSP shall timely comply with all the requirements that may be laid down by the State Commission for extension of the term of the Transmission License beyond the initial term of twenty-five (25) years & upto the Expiry Date and the TSP shall keep the Long Term Transmission Customer fully informed about the progress on its application for extension of the term of the Transmission License.

2.4 Survival:

The expiry or termination of this Agreement shall not affect any accrued rights, obligations/ roles and liabilities of the Parties under this Agreement, including the right to receive liquidated damages as per the terms of this Agreement, nor shall it effect the survival of any continuing obligations/ roles for which this Agreement provides, either expressly or by necessary implication, which are to survive after the Expiry Date or termination including those under Articles 3.3.3, 3.3.5, Article 9.3 (Application of Insurance Proceeds), Article 11 (Force Majeure), Article 13 (Events of Default and Termination), Article 14 (Liability & Indemnification), Article 16 (Governing Law & Dispute Resolution), Article 19 (Miscellaneous).

2.5 Applicability of the provisions of this Agreement

2.5.1 For the purpose of Availability, Target Availability and the computation of Availability, Incentive, Penalty, the provisions provided in this Agreement shall apply and any future modifications in the relevant Rules and Regulations shall not be applicable for this Project.

2.5.2 For the purposes of this Agreement for Intra-State transmission systems developed under the tariff based competitive bidding framework, the provisions relating to the definitions (Availability and COD), Article 3 (Contract Performance Guarantee and Conditions Subsequent), Article 5 (Construction of the Project), Article 6 (Connection and Commissioning of the Project), Article 8 (Target Availability and calculation of Availability), Article 11 (Force Majeure), Article 12 (Change in Law), Article 13 (Event of Default), Article 14 (Indemnification), Article 15 (Assignment and Charges), Articles 16.1, 16.2 and 16.4 (Governing Laws and Dispute Resolution) and Article 17 (representation and warranties of the Licensee) of this agreement shall supersede the corresponding provisions of relevant Regulations.

ARTICLE: 3

3 CONDITIONS SUBSEQUENT

3.1 Satisfaction of conditions subsequent by the TSP

3.1.1 Within ten (10) days from the date of issue of Letter of Intent, the Selected Bidder, shall:

a. Provide the Contract Performance Guarantee, and

b. Acquire, for the Acquisition Price, one hundred percent (100%) equity shareholding of MP Power Transmission Package-I Limited from REC Power Development and Consultancy Limited, who shall sell to the Selected Bidder, the equity shareholding of MP Power Transmission Package-I Limited, along with all its related assets and liabilities.

c. Execute this Agreement;

The TSP shall, within five (5) working days from the date of acquisition of SPV by the Selected Bidder, undertake to apply to the State Commission for the grant of Transmission License and for the adoption of tariff as required under section-63 of the Electricity Act.

The Selected Bidder, on behalf of the TSP, will provide to the M.P. Power Management Company Limited the Contract Performance Guarantee for an amount of Rs. 28.90 Crores (Rupees Twenty Eight Crore Ninety Lakh Only).

3.1.2 The Contract Performance Guarantee shall be initially valid for a period up to three (3) months after the Scheduled COD of the Project and shall be extended from time to time to be valid for a period up to three (3) months after the COD of the Project. In case the validity of the Contract Performance Guarantee is expiring before the validity specified in this Article, the TSP shall, at least thirty (30) days before the expiry of the Contract Performance Guarantee, replace the Contract Performance Guarantee with another Contract Performance Guarantee or extend the validity of the existing Contract Performance Guarantee until the validity period specified in this Article.

3.1.3 The TSP agrees and undertakes to duly perform and complete the following activities within six (6) months from the Effective Date (except for c) below), unless such completion is affected due to any Force Majeure Event, or if any of the activities is specifically waived in writing

by the Long Term Transmission Customer:

a. To obtain the Transmission License for the Project from the State Commission;

b. To obtain the order for adoption of Transmission Charges by the State Commission, as required under Section 63 of the Electricity Act 2003;

c. To submit to the Long Term Transmission Customer, STU & Independent Engineer, the Project Execution Plan, immediately after award of contract(s) and maximum within one hundred and twenty (120) days from the Effective Date. Also, an approved copy each of Manufacturing Quality Plan (MQP) and Field Quality Plan (FQP) would be submitted to Independent Engineer & Long Term Transmission Customer in the same time period. The TSP's Project Execution Plan should be in conformity with the Scheduled COD as specified in Schedule 2 of this Agreement, and shall bring out clearly the organization structure, time plan and methodology for executing the Project, award of major contracts, designing, engineering, procurement, shipping, construction, testing and commissioning to commercial operation;

d. To submit to the Long Term Transmission Customer, STU & Independent Engineer a detailed bar (GANTT) chart of the Project outlining each activity (taking longer than one Month), linkages as well as durations;

e. To submit to the Long Term Transmission Customer, STU& Independent Engineer detailed specifications of conductor meeting the functional specifications specified in RFP;

f. To achieve Financial Closure;

g. To provide an irrevocable letter to the Lenders duly accepting and acknowledging the rights provided to the Lenders under the provisions of Article 15.3 of this Agreement and all other RFP Project Documents; and

h. To award the Engineering, Procurement and Construction contract ("EPC contract") for the design and construction of the Project and shall have given to such Contractor an irrevocable notice to proceed.

3.2 Recognition of Lenders' Rights by the Long Term Transmission Customer

3.2.1 The Long Term Transmission Customer hereby accepts and acknowledges the rights provided to the Lenders as per Article 15.3 of this Agreement and all other RFP Project Documents.

3.3 Consequences of non-fulfilment of conditions subsequent

3.3.1 If any of the conditions specified in Article 3.1.3 is not duly fulfilled by the TSP even within three (3) Months after the time specified therein, then on and from the expiry of such period and until the TSP has satisfied all the conditions specified in Article 3.1.3, the TSP shall, on a monthly basis, be liable to furnish to M.P. Power Management Company Limited additional Contract Performance Guarantee of Rupees 2.89 Crores (Rs. Two Crore Eighty Nine Lakh Only within two (2) Business Days of expiry of every such Month. Such additional Contract Performance Guarantee shall be provided to M.P. Power Management Company Limited in the manner provided in Article 3.1.1 and shall become part of the Contract Performance Guarantee and all the provisions of this Agreement shall be construed accordingly. M.P. Power Management Company Limited shall be entitled to hold and / or invoke the Contract Performance Guarantee, including such additional Contract Performance Guarantee, in accordance with the provisions of this Agreement.

3.3.2 Subject to Article 3.3.4, if:

(i) the fulfilment of any of the conditions specified in Article 3.1.3 is delayed beyond nine (9) Months from the Effective Date and the TSP fails to furnish additional Contract Performance Guarantee to the M.P. Power Management Company Limited in accordance with Article 3.3.1 hereof; or

(ii) the TSP furnishes additional Performance Guarantee to the M.P. Power Management Company Limited in accordance with Article 3.3.1 hereof but fails to fulfil the conditions specified in Article 3.1.3 within a period of twelve (12) months from the Effective Date,

the Long Term Transmission Customer shall have the right to terminate this Agreement, by giving a Termination Notice to the TSP, in writing, of at least seven (7) days, with a copy to Government of Madhya Pradesh, STU and the Lenders' Representative in order to enable the Lenders to exercise right of substitution in accordance with Article 15.3 of this Agreement.

3.3.3 If the Long Term Transmission Customer elects to terminate this Agreement as per the provisions of Article 3.3.2, the TSP shall be liable to pay to the Long Term Transmission Customer an amount of Rupees Rs. 28.90 Crores (Rupees Twenty Eight Crore Ninety Lakh Only) only as liquidated damages. The Long Term Transmission Customer shall be entitled to recover this amount of damages by invoking the Contract Performance Guarantee to the extent of liquidated damages, which shall be required by the Long Term Transmission Customer, and the balance shall be returned to TSP, if any.

It is clarified for removal of doubt that this Article shall survive the termination of this Agreement.

3.3.4 In case of inability of the TSP to fulfil the conditions specified in Article 3.1.3 due to any Force Majeure Event, the time period for fulfilment of the condition subsequent as mentioned in Article 3.1.3, may be extended for a period of such Force Majeure Event. Alternatively, if deemed necessary, this Agreement may be terminated by the Long Term Transmission Customer by giving a Termination Notice to the TSP, in writing, of at least seven (7) days, with a copy to Government of Madhya Pradesh, STU and the Lenders' Representative in order to enable the Lenders to exercise right of substitution in accordance with Article 15.3 of this Agreement and the Contract Performance Guarantee shall be returned as per the provisions of Article 6.5.1.

Provided, that due to the provisions of this Article 3.3.4, any increase in the time period for completion of conditions subsequent mentioned under Article 3.1.3, shall lead to an equal increase in the time period for the Scheduled COD. If the Scheduled COD is extended beyond a period of one hundred eighty (180) days due to the provisions of this Article 3.3.4, the TSP will be allowed to recover the interest cost during construction corresponding to the period exceeding one hundred eighty (180) days by adjustment in the Transmission Charges in accordance with Schedule 9.

3.3.5 Upon termination of this Agreement as per Articles 3.3.2 and 3.3.4, the Government of Madhya Pradesh/ STU may take steps to bid out the Project again.

3.3.6 The Long Term Transmission Customer, on the failure of the TSP to fulfil its obligations, if it considers that there are sufficient grounds for so doing, apart from invoking the Contract Performance Guarantee under para 3.3.3 may also initiate proceedings for blacklisting the TSP as per provisions of Article 13.2 of TSA.

3.4 Progress Reports

The TSP shall notify the Long Term Transmission Customer and STU in writing at least once a Month on the progress made in satisfying the conditions subsequent in Articles 3.1.3.

ARTICLE: 4

4 DEVELOPMENT OF THE PROJECT

4.1 TSP's obligations in development of the Project:

Subject to the terms and conditions of this Agreement, the TSP at its own cost and expense shall observe, comply with, perform, undertake and be responsible:

a. for procuring and maintaining in full force and effect all Consents, Clearances and Permits, required in accordance with Law for development of the Project;

b. for financing, constructing, owning and commissioning each of the Element of the Project for the scope of work set out in Schedule 1 of this Agreement in accordance with:

i. the Electricity Act and the Rules made thereof;

ii. the Grid Code;

iii. the CEA Regulations applicable, and as amended from time to time, for Transmission Lines and sub-stations:

- the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007;
- Central Electricity Authority (Technical Standards for construction of Electrical Plants and Electric Lines) Regulation, 2010;
- Central Electricity Authority (Grid Standard) Regulations, 2010;
- Central Electricity Authority (Safety requirements for construction, operation and maintenance of Electrical Plants and Electrical Lines) Regulation, 2011;
- Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulation, 2010;
- Central Electricity Authority (Technical Standards for Communication System in Power System Operation) Regulations, 2020.

iv. Safety/ security Guidelines laid down by the Central Government and State Government;

v. Prudent Utility Practices, relevant Indian Standards and the Law;

not later than the Scheduled COD as per Schedule 2 of this Agreement;

c. for entering into a Connection Agreement with the concerned parties in accordance with the Grid Code.

d. for owning the Project throughout the term of this Agreement free and clear of any encumbrances except those expressly permitted under Article 15 of this Agreement;

e. to co-ordinate and liaise with concerned agencies and provide on a timely basis relevant information with regard to the specifications of the Project that may be required for interconnecting the Project with the Interconnection Facilities;

f. for providing all assistance to the Arbitrators as they may require for the performance of their duties and responsibilities;

g. to provide to the Long Term Transmission Customer and STU , on a monthly basis, progress reports with regard to the Project and its execution (in accordance with prescribed form) to enable the Long Term Transmission Customer and STU to monitor and co-ordinate the development of the Project matching with the Interconnection Facilities;

h. to comply with Ministry of Power order no. 25-11/6/2018 – PG dated 02.07.2020 as well as other Guidelines issued by Govt. of India pertaining to this;

i. to procure the products associated with the Transmission System as per provisions of Public Procurement (Preference to Make in India) orders issued by Ministry of Power vide orders No. 11/5/2018 - Coord. dated 28.07.2020 for transmission sector, as amended from time to time read with Department for Promotion of Industry and Internal Trade (DPIIT) orders in this regard (Procuring Entity as defined in above orders shall deemed to have included Selected Bidder and/ or TSP).

Also, to comply with Department of Expenditure, Ministry of Finance vide Order (Public Procurement No 1) bearing File No. 6/18/2019-PPD dated 23.07.2020, Order (Public Procurement No 2) bearing File No. 6/18/2019-PPD dated 23.07.2020 and Order (Public Procurement No. 3) bearing File No. 6/18/2019-PPD, dated 24.07.2020, as amended from time

to time, regarding public procurement from a bidder of a country, which shares land border with India;

j. to submit to Long Term Transmission Customer information in the prescribed format [To be devised by Long Term Transmission Customer] for ensuring compliance to Article 4.1 i) above.

k. to comply with all its obligations undertaken in this Agreement.

4.2 Roles of the Long Term Transmission Customer in implementation of the Project:

4.2.1 Subject to the terms and conditions of this Agreement, the Long Term Transmission Customer shall be the holder and administrator of this Agreement and shall inter alia:

a. appoint an Independent Engineer within 90 days of the Effective Date

b. provide letters of recommendation to the concerned Indian Governmental Instrumentality, as may be requested by the TSP from time to time, for obtaining the Consents, Clearances and Permits required for the Project;

c. coordinate among TSP and upstream/downstream entities in respect of Interconnection Facilities; and

d. monitor the implementation of the Agreement and take appropriate action for breach thereof including revocation of guarantees, cancellation of Agreement, blacklisting etc

e. provide all assistance to the Arbitrators as required for the performance of their duties and responsibilities; and

f. perform any other responsibility (ies) as specified in this Agreement.

4.3 Time for Commencement and Completion:

a. The TSP shall take all necessary steps to commence work on the Project from the Effective Date of the Agreement and shall achieve Scheduled COD of the Project in accordance with the time schedule specified in Schedule 2 of this Agreement;

b. The COD of each Element of the Project shall occur no later than the Scheduled COD or within such extended time to which the TSP shall be entitled under Article 4.4 hereto.

4.4 Extension of time:

4.4.1 In the event that the TSP is unable to perform its obligations for the reasons solely attributable to the Long Term Transmission Customer , the Scheduled COD shall be extended, by a 'day to day' basis, subject to the provisions of Article 13.

4.4.2 In the event that an Element or the Project cannot be commissioned by its Scheduled COD on account of any Force Majeure Event as per Article 11, the Scheduled COD shall be extended, by a 'day to day' basis for a period of such Force Majeure Event. Alternatively, if deemed necessary, the Long Term Transmission Customer may terminate the Agreement as per the provisions of Article 13.4 by giving a Termination Notice to the TSP, in writing, of at least seven (7) days, with a copy to Government of Madhya Pradesh, STU and the Lenders' Representative in order to enable the Lenders to exercise right of substitution in accordance with Article 15.3 of this Agreement.

4.4.3 If the Parties have not agreed, within thirty (30) days after the affected Party's performance has ceased to be affected by the relevant circumstance, on how long the Scheduled COD should be deferred by, any Party may raise the Dispute to be resolved in accordance with Article 16.

4.5 Metering Arrangements:

4.5.1 The TSP shall comply with all the provisions of the Grid Code and the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 as amended from time to time, with regard to the metering arrangements for the Project. The TSP shall fully cooperate with the CTU / STU / RLDC and extend all necessary assistance in taking meter readings.

4.6 Interconnection Facilities:

4.6.1 Subject to the terms and conditions of this Agreement, the TSP shall be responsible for connecting the Project with the interconnection point(s) specified in Schedule 1 of this Agreement. The Interconnection Facilities shall be developed as per the scope of work and responsibilities assigned in Schedule 1 of this Agreement. The Long Term Transmission Customer shall be responsible for coordinating to make available the Interconnection Facilities.

4.6.2 In order to remove any doubts, it is made clear that the obligation of the TSP within the scope of the project is to construct the Project as per Schedule-1 of this Agreement and in particular to connect it to the Interconnection Facilities as specified in this Agreement.

ARTICLE: 5

5 CONSTRUCTION OF THE PROJECT

5.1 TSP's Construction Responsibilities:

5.1.1 The TSP, at its own cost and expense, shall be responsible for designing, constructing, erecting, testing and commissioning each Element of the Project by the Scheduled COD in accordance with the Regulations and other applicable Laws specified in Article 4.1 of this Agreement.

5.1.2 The TSP acknowledges and agrees that it shall not be relieved from any of its obligations under this Agreement or be entitled to any extension of time or any compensation whatsoever by reason of the unsuitability of the Site or Transmission Line route(s).

5.1.3 The TSP shall be responsible for obtaining all Consents, Clearances and Permits related but not limited to road / rail / river / canal / power line / crossings, Power and Telecom Coordination Committee (PTCC), defence, civil aviation, right of way / way-leaves and environmental & forest clearances from relevant authorities required for developing, financing, constructing, maintaining/ renewing all such Consents, Clearances and Permits in order to carry out its obligations under this Agreement in general and shall furnish to the Long Term Transmission Customer such copy/ies of each Consents, Clearances and Permits, on demand. Long Term Transmission Customer shall provide letters of recommendation to the concerned Indian Governmental Instrumentality, as may be requested by the TSP from time to time, for obtaining the Consents, Clearances and Permits required for the Project.

5.1.4 The TSP shall be responsible for:

(a) acquisition of land for location specific substations, switching stations or HVDC terminal or inverter stations;

(b) final selection of Site including its geo-technical investigation;

(c) survey and geo-technical investigation of line route in order to determine the final route of the Transmission Lines;

(d) seeking access to the Site and other places where the Project is being executed, at its own risk and costs, including payment of any crop, tree compensation or any other compensation as may be required.

5.1.5 In case the Project involves any resettlement and rehabilitation, the resettlement and rehabilitation package will be implemented by the State Government authorities, for which the costs is to be borne by the TSP and no changes would be allowed in the Transmission Charges on account of any variation in the resettlement and rehabilitation cost. The TSP shall provide assistance on best endeavour basis, in implementation of the resettlement and rehabilitation package, if execution of such package is in the interest of expeditious implementation of the Project and is beneficial to the Project affected persons.

5.2 Appointing Contractors:

5.2.1 The TSP shall conform to the requirements as provided in this Agreement while appointing Contractor(s) for procurement of goods & services.

5.2.2 The appointment of such Contractor(s) shall neither relieve the TSP of any of its obligations under this Agreement nor make the Long Term Transmission Customer liable for the performance of such Contractor(s).

5.3 Monthly Progress Reporting:

The TSP shall provide to the STU, Long Term Transmission Customer & Independent Engineer, on a monthly basis, progress reports along with likely completion date of each Element with regard to the Project and its execution (in accordance with prescribed form). The Long Term Transmission Customer/ STU shall monitor the development of the Project for its timely completion for improving and augmenting the electricity system as a part of its statutory responsibility.

5.4 Quality of Workmanship:

The TSP shall ensure that the Project is designed, built and completed in a good workmanship using sound engineering and construction practices, and using only materials and equipment that are new and manufactured as per the MQP and following approved FQP for erection, testing & commissioning and complying with Indian /International Standards such that, the useful life of the Project will be at least thirty five (35) years from the COD of the Project.

The TSP shall ensure that all major substation equipment / component (e.g. transformers, reactors, Circuit Breakers, Instrument Transformers (IT), Surge Arresters (SA), Protection relays, clamps & connectors etc.), equipment in terminal stations of HVDC installations including Thyristor/

IGBT valves, Converter Transformers, smoothing reactors, Transformer bushings and wall bushings, GIS bus ducts, towers and gantry structures and transmission towers or poles and line materials (conductors, earthwire, OPGW, insulator, accessories for conductors, OPGW & earthwires, hardware fittings for insulators, aviation lights etc), facilities and system shall be designed, constructed and tested (Type test, Routine tests, Factory Acceptance Test (FAT)) in accordance with relevant CEA Regulations and Indian Standards. In case Indian Standards for any particular equipment/ system/ process is not available, IEC/ IEEE or equivalent International Standards and Codes shall be followed.

5.5 Progress Monitoring & Quality Assurance:

5.5.1 The Project Execution Plan submitted by the TSP in accordance with Article 3.1.3 c) shall comprise of detailed schedule of all the equipments/items /materials required for the Project, right from procurement of raw material till the dispatch from works and receipt at the site. Further, it should also include various stages of the construction schedule up to the commissioning of the Project.

5.5.2 Long Term Transmission Customer, STU & Independent Engineer shall have access at all reasonable times to the Site and to the Manufacturer's works and to all such places where the Project is being executed.

5.5.3 Independent Engineer shall ensure conformity of the conductor specifications with the functional specifications specified in RFP.

5.5.4 The Independent Engineer shall monitor the following during construction of the Project:

a) Quality of equipments, material, foundation, structures and workmanship etc. as laid down in Article 5.4 and 6.1.4 of the TSA. Specifically, quality of Sub-station equipments, transmission line material and workmanship etc. would be checked in accordance with the Article 5.4.

b) Progress in the activities specified in Condition Subsequent

c) Verification of readiness of the elements including the statutory clearances & completion of civil works, fixing of all components and finalisation of punch points (if any) prior to charging of the elements

d) Progress of construction of substation and Transmission Lines

5.5.5 The progress shall be reviewed by the Independent Engineer against the Project Execution Plan. The Independent Engineer shall prepare its report

on monthly basis and submit the same to Long Term Transmission Customer highlighting the progress achieved till the end of respective month vis-à-vis milestone activities, areas of concern, if any, which may result in delay in the timely completion of the Project. Based on the progress, Long Term Transmission Customer and/ or STU shall issue written instructions to the TSP to take corrective measures, as may be prudent for the timely completion of the Project. In case of any deficiency, the Long Term Transmission Customer would be at liberty to take action in accordance with the procedure of this Agreement.

5.5.6 For any delay in commissioning any critical Element(s), as identified in Schedule 1 & Schedule 2 of this Agreement, beyond a period of 45 days shall lead to a sequestration of 10% of the Contract Performance Guarantee.

5.6 Site regulations and Construction Documents

The TSP shall abide by the Safety Rules and Procedures as mentioned in Schedule 3 of this Agreement

The TSP shall retain at the Site and make available for inspection at all reasonable times, copies of the Consents, Clearances and Permits, construction drawings and other documents related to construction.

5.7 Supervision of work:

The TSP shall provide all necessary superintendence for execution of the Project and its supervisory personnel shall be available to provide full-time superintendence for execution of the Project. The TSP shall provide skilled personnel who are experienced in their respective fields.

5.8 Remedial Measures:

The TSP shall take all necessary actions for remedying the shortfall in achievement of timely progress in execution of the Project, if any, as intimated by the Independent Engineer and/ or STU and/ or the Long Term Transmission Customer. However, such intimation by the Independent Engineer and/ or STU and/ or the Long Term Transmission Customer and the subsequent effect of such remedial measures carried out by the TSP shall not relieve the TSP of its obligations in the Agreement. Independent Engineer and/ or STU and/ or the Long Term Transmission Customer may carry out random inspections during the Project execution, as and when deemed necessary by it. If the shortfalls as intimated to the TSP are not remedied to the satisfaction of the STU and/ or the Long Term Transmission Customer, this Agreement may be

terminated by the Long Term Transmission Customer by giving a Termination Notice to the TSP, in writing, of at least seven (7) days, with a copy to Government of Madhya Pradesh, STU and the Lenders' Representative in order to enable the Lenders to exercise right of substitution in accordance with Article 15.3 of this Agreement .

ARTICLE: 6

6 CONNECTION AND COMMISSIONING OF THE PROJECT

6.1 Connection with the Inter-Connection Facilities:

6.1.1 The TSP shall give the RLDC(s), CTU, / STU, as the case may be, and any other agencies as required, at least sixty (60) days advance written notice of the date on which it intends to connect an Element of the Project, which date shall not be earlier than its Scheduled COD or Schedule COD extended as per Article 4.4.1 & 4.4.2 of this Agreement, unless mutually agreed to by Parties. Further, any preponing of COD of any element prior to Scheduled COD must be approved by the Long Term Transmission Customer.

6.1.2 The RLDC / SLDC (as the case may be) or the CTU / STU (as the case may be), for reasonable cause, including non-availability of Interconnection Facilities as per Article 4.2, can defer the connection for up to fifteen (15) days from the date notified by the TSP pursuant to Article 6.1.1, if it notifies to the TSP in writing, before the date of connection, of the reason for the deferral and when the connection is to be rescheduled. However, no such deferment on one or more occasions would be for more than an aggregate period of thirty (30) days. Further, the Scheduled COD would be extended as required, for all such deferments on “day to day” basis.

6.1.3 Subject to Articles 6.1.1 and 6.1.2, any Element of Project may be connected with the Interconnection Facilities when:

a. it has been completed in accordance with this Agreement and the Connection Agreement;

b. it meets the Grid Code, Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 as amended from time to time and all other Indian legal requirements, and

c. The TSP has obtained the approval in writing of the Electrical Inspector certifying that the Element is ready from the point of view of safety of supply and can be connected with the Interconnection Facilities.

d. It has satisfactorily met all the testing requirements as per Articles 6.1.4

6.1.4 Site Acceptance Test (SAT)/ pre-commissioning tests of all major substation equipment, component, system, facilities shall be successfully carried out before commissioning. The Type tests, FAT and SAT reports should be available at the substation / terminal station of HVDC installations for ready reference of operation and maintenance staff and has to be made available to the Independent Engineer appointed for quality monitoring or their authorised representatives, as and when they wish to examine the same.

6.2 Commercial Operation:

6.2.1 An Element of the Project shall be declared to have achieved COD twenty four (24) hours following the connection of the Element with the Interconnection Facilities pursuant to Article 6.1 or seven (7) days after the date on which it is declared by the TSP to be ready for charging but is not able to be charged for reasons not attributable to the TSP subject to Article 6.1.2.

Provided that an Element shall be declared to have achieved COD only after all the Element(s), if any, which are pre-required to have achieved COD as defined in Schedule 2 of this Agreement, have been declared to have achieved their respective COD.

6.2.2 Once any Element of the Project has been declared to have achieved deemed COD as per Article 6.2.1 above, such Element of the Project shall be deemed to have Availability equal to the Target Availability till the actual charging of the Element and to this extent, TSP shall be eligible for the Monthly Transmission Charges applicable for such Element

6.3 Compensation for Direct Non Natural Force Majeure Event or Indirect Non Natural Force Majeure Event or Natural Force Majeure Event (affecting the Long Term Transmission Customer)

6.3.1 If the TSP is otherwise ready to connect the Element(s) of the Project and has given due notice, as per provisions of Article 6.1.1, to the concerned agencies of the date of intention to connect the Element(s) of the Project, where such date is not before the Scheduled COD, but is not able to connect the Element(s) of the Project by the said date specified in the notice, due to Direct Non Natural Force Majeure Event or Indirect Non Natural Force Majeure Event or Natural Force Majeure Event affecting the Long Term Transmission Customer, provided such Direct Non Natural Force Majeure Event or Indirect Non Natural Force Majeure Event or Natural Force Majeure Event affecting the Long Term

Transmission Customer has continued for a period of more than three (3) continuous or non-continuous Months, the TSP shall, until the effects of the Direct Non Natural Force Majeure Event or of Indirect Non Natural Force Majeure Event or Natural Force Majeure Event affecting the Long Term Transmission Customer no longer prevent the TSP from connecting the Element(s) of the Project, be deemed to have achieved COD relevant to that date and to this extent, be deemed to have been providing Transmission Service with effect from the date notified, and shall be treated as follows:

a. In case of delay due to Direct Non Natural Force Majeure Event, TSP is entitled for Transmission Charges calculated on Target Availability for the period of such events in excess of three (3) continuous or non continuous Months in the manner provided in (c) below.

b. In case of delay due to Indirect Non Natural Force Majeure Event or Natural Force Majeure Event affecting the Long Term Transmission Customer , TSP is entitled for payment for debt service which is due under the Financing Agreements, subject to a maximum of Transmission Charges calculated on Target Availability, for the period of such events in excess of three (3) continuous or non continuous Months in the manner provided in (c) below.

c. In case of delay due to Direct Non Natural Force Majeure Event or Indirect Non Natural Force Majeure Event or Natural Force Majeure Event affecting the Long Term Transmission Customer , the TSP is entitled for payments mentioned in (a) and (b) above, after commencement of Transmission Service, in the form of an increase in Transmission Charges. These amounts shall be paid from the date, being the later of a) the date of cessation of such Indirect Non Natural Force Majeure Event or Natural Force Majeure Event affecting the Long Term Transmission Customer and b) the completion of sixty (60) days from the receipt of the Financing Agreements by the Long Term Transmission Customer from the TSP.

   Provided such increase in Transmission Charges shall be so as to put the TSP in the same economic position as the TSP would have been in case the TSP had been paid amounts mentioned in (a) and (b) above in a situation where the Force Majeure Event had not occurred.

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6.4 Liquidated Damages for Delay in achieving COD of Project:

6.4.1 If the TSP fails to achieve COD of any Element of the Project or the Project, by the Element's / Project's Scheduled COD or such Scheduled COD as extended under Articles 4.4.1 and 4.4.3, then the TSP shall pay to the Long Term Transmission Customer , a sum equivalent to 3.33% of Monthly Transmission Charges applicable for the Element of the Project [in case where no Elements have been defined, to be on the Project as a whole] / Project, for each day of delay up to sixty (60) days of delay and beyond that time limit, at the rate of five percent (5%) of the Monthly Transmission Charges applicable to such Element / Project, as liquidated damages for such delay and not as penalty, without prejudice to any rights of the Long Term Transmission Customer under the Agreement.

6.4.2 The TSP's maximum liability under this Article 6.4 shall be limited to the amount of liquidated damages calculated in accordance with Article 6.4.1 for and up to six (6) months of delay for the Element or the Project.

Provided that, in case of failure of the TSP to achieve COD of the Element of the Project even after the expiry of six (6) months from its Scheduled COD, the provisions of Article 13 shall apply.

6.4.3 The TSP shall make payment to the Long Term Transmission Customer of the liquidated damages calculated pursuant to Article 6.4.1 within ten (10) days of the earlier of:

a. the date on which the applicable Element achieves COD; or

b. the date of termination of this Agreement.

The payment of such damages shall not relieve the TSP from its obligations to complete the Project or from any other obligation and liabilities under the Agreement.

6.4.4 If the TSP fails to pay the amount of liquidated damages to the Long Term Transmission Customer within the said period of ten (10) days, the Long Term Transmission Customer shall be entitled to recover the said amount of the liquidated damages by invoking the Contract Performance Guarantee. If the then existing Contract Performance Guarantee is for an amount which is less than the amount of the liquidated damages payable by the TSP to the Long Term Transmission Customer under this Article 6.3 and the TSP fails to make payment of the balance amount of the

liquidated damages not covered by the Contract Performance Guarantee, then such balance amount shall be deducted from the Transmission Charges payable to the TSP. The right of the Long Term Transmission Customer to encash the Contract Performance Guarantee is without prejudice to the other rights of the Long Term Transmission Customer under this Agreement.

6.4.5 For avoidance of doubt, it is clarified that amount payable by TSP under this Article is over and above the penalty payable by TSP under Article 5.5.6 of this Agreement.

6.5 Return of Contract Performance Guarantee

6.5.1 The Contract Performance Guarantee as submitted by TSP in accordance with Article 3.1.1 shall be released by the Long Term Transmission Customer within three (3) months from the COD of the Project. In the event of delay in achieving Scheduled COD of any of the Elements by the TSP (otherwise than due to reasons as mentioned in Article 3.1.3 or Article 11) and consequent part invocation of the Contract Performance Guarantee by the Long Term Transmission Customer, Long Term Transmission Customer shall release the Contract Performance Guarantee, if any remaining unadjusted, after the satisfactory completion by the TSP of all the requirements regarding achieving the Scheduled COD of the remaining Elements of the Project. It is clarified that the Long Term Transmission Customer shall also return / release the Contract Performance Guarantee in the event of (i) applicability of Article 3.3.2 to the extent the Contract Performance Guarantee is valid for an amount in excess of Rupees Rs. 28.90 Crores (Rupees Twenty Eight Crore Ninety Lakh Only), or (ii) termination of this Agreement by the Long Term Transmission Customer as mentioned under Article 3.3.4 of this Agreement.

6.5.2 The release of the Contract Performance Guarantee shall be without prejudice to other rights of the Long Term Transmission Customer under this Agreement.

ARTICLE: 7

7 OPERATION AND MAINTENANCE OF THE PROJECT

7.1 Operation and Maintenance of the Project:

The TSP shall be responsible for ensuring that the Project is operated and maintained in accordance with the regulations made by the State Commission and CEA from time to time and provisions of the Act.

ARTICLE: 8

8 AVAILABILITY OF THE PROJECT

8.1 Calculation of Availability of the Project:

Calculation of Availability for the Elements and for the Project, as the case may be, shall be as per Appendix II to III of Madhya Pradesh Electricity Regulatory Commission (Terms and Conditions for Determination of Transmission Tariff) (Revision-IV) Regulations, 2020, as applicable on the Bid Deadline and as appended in Schedule 6 of this Agreement.

8.2 Target Availability:

The Target Availability of each Element and the Project shall be 98%.

Payment of monthly Transmission charges based on actual availability will be calculated as per para 1.2 of Schedule 4 of this Agreement.

If the availability of any Element or the Project is below the Target Availability, for six consecutive months in a Contract Year, the Long Term Transmission Customer or STU may issue a show cause notice to the TSP, asking them to show cause as to why the Transmission Service Agreement be not terminated, and if no satisfactory cause is shown it may terminate the Agreement. If the Long Term Transmission Customer or STU is of the opinion that the transmission system is of critical importance, it may carry out or cause to carry the operation and maintenance of transmission system at the risk and cost of TSP.

ARTICLE: 9

9 INSURANCES

9.1 Insurance:

9.1.1 The TSP shall effect and maintain or cause to be effected and maintained during the Construction Period and the Operating Period, adequate Insurances against such risks, with such deductibles including but not limited to any third party liability and endorsements and co-beneficiary/insured, as may be necessary under

a. any of the Financing Agreements,

b. the Laws, and

c. in accordance with Prudent Utility Practices.

The Insurances shall be taken effective from a date prior to the date of the Financial Closure till the Expiry Date.

9.2 Evidence of Insurance cover:

9.2.1 The TSP shall furnish to the Long Term Transmission Customer copies of certificates and policies of the Insurances, as and when the Long Term Transmission Customer may seek from the TSP as per the terms of Article 9.1

9.3 Application of Insurance Proceeds:

9.3.1 Save as expressly provided in this Agreement, the policies of Insurances and the Financing Agreements, the proceeds of any insurance claim made due to loss or damage to the Project or any part of the Project shall be first applied to reinstatement, replacement or renewal of such loss or damage.

9.3.2 If a Natural Force Majeure Event renders the Project no longer economically and technically viable and the insurers under the Insurances make payment on a “total loss” or equivalent basis, the portion of the proceeds of such Insurance available to the TSP (after making admissible payments to the Lenders as per the Financing Agreements) shall be allocated only to the TSP. Long Term Transmission Customer and/ or STU shall have no claim on such proceeds of the Insurance.

9.3.3 Subject to the requirements of the Lenders under the Financing

Agreements, any dispute or difference between the Parties as to whether the Project is no longer economically and technically viable due to a Force Majeure Event or whether that event was adequately covered in accordance with this Agreement by the Insurances shall be determined in accordance with Article 16.

9.4 Effect on liability of the Long Term Transmission Customer & STU

9.4.1 The Long Term Transmission Customer and STU shall have no financial obligations or liability whatsoever towards the TSP in respect of this Article 9.

ARTICLE: 10

10 BILLING AND PAYMENT OF TRANSMISSION CHARGES

10.1 Subject to provisions of this Article 10, the Monthly Transmission Charges shall be paid to the TSP, in Indian Rupees, on monthly basis as per the provisions of this Agreement, from the date on which an Element(s) has achieved COD until the Expiry Date of this Agreement, unless terminated earlier and in line with the provisions of Schedule 4 of this Agreement.

10.1.1 Delivery of Invoices:

10.1.1.1 TSP's Invoices

a. Commencing with the month following the month in which the COD of an Element (which is first Commissioned) occurs, the TSP shall submit to Long Term Transmission Customer by the fifth day of such and each succeeding month (or, if such day is not a Business Day, the immediately following Business Day) an Invoice in the Agreed Form (the "Monthly Transmission Charge Invoice") signed by the authorised signatory of the TSP setting out the computation of the Monthly Transmission Charges to be paid by the Long Term Transmission Customer to the TSP in respect of the immediately preceding month in accordance with this Agreement; and

b. Each Monthly Transmission Charge Invoice shall include detailed calculations of the amounts payable under it, together with such further supporting documentation and information as Long Term Transmission Customer may reasonably require / request, from time to time.

10.1.1.2 Long Term Transmission Customer Invoices

a. Long Term Transmission Customer shall (as and when any amount becomes due to be paid by TSP), on the fifth day of the month (or, if such day is not a Business Day, the immediately following Business Day) submit to the TSP an Invoice in the Agreed Form (the "Long Term Transmission Customer Invoice") setting out the computation of any amount that may be payable to it by the TSP for the immediately preceding month pursuant to this Agreement.

b. Each Long Term Transmission Customer's Invoice shall include detailed calculations of the amounts payable under it, together with such further supporting documentation as the TSP may reasonably require/request, from time to time.

10.1.2 Payment of Invoices:

10.1.2.1 Any amount payable under an Invoice shall be paid in immediately available and freely transferable clear funds, for value on or before the Due Date, to such account of the TSP or Long Term Transmission Customer as shall have been previously notified to Long Term Transmission Customer or the TSP, as the case may be.

10.1.2.2 Where in respect of any month there is both:

a. an amount payable by the Long Term Transmission Customer to TSP pursuant to a Monthly Transmission Charge Invoice and

b. an amount payable by the TSP to Long Term Transmission Customer pursuant to a Long Term Transmission Customer's Invoice as per provisions of this Agreement,

the two amounts, to the extent agreed to be set off by the TSP may, be set off against each other and the balance, if any, shall be paid by Long Term Transmission Customer to the TSP or by TSP to Long Term Transmission Customer, as the case may be.

10.1.2.3 The Long Term Transmission Customer shall pay the amount payable under the Monthly Transmission Charge Invoice and the Supplementary Bill on the Due Date to such account of the TSP, as shall have been previously notified by the TSP to the Long Term Transmission Customer in accordance with Article 10.1.2.6 below.

10.1.2.4 All payments made by the Long Term Transmission Customer shall be appropriated by the TSP in the following order of priority:

i. towards Late Payment Surcharge, payable to the TSP, if any;

ii. towards earlier unpaid Monthly Transmission Charge Invoice, if any;

iii. towards earlier unpaid Supplementary Bill, if any;

iv. towards the then current Monthly Transmission Charge Invoice, if any; and

v. towards the then current Supplementary Bill.

10.1.2.5 All payments required to be made under this Agreement shall only include any deduction or set off for:

i. deductions required by the Law; and

ii. amounts claimed by the Long Term Transmission Customer from the TSP, through an Invoice duly acknowledged by the TSP, to be payable by the TSP, and not disputed by the TSP within thirty (30) days of receipt of the said Invoice and such deduction or set-off shall be made to the extent of the amounts not disputed. It is clarified that the Long Term Transmission Customer shall be entitled to claim any set off or deduction under this Article, after expiry of the said thirty (30) day period.

Provided further, the maximum amounts that can be deducted or set-off by all the Long Term Transmission Customer taken together under this Article in a Contract Year shall not exceed Rupees 9.63 Crores (Rupees Nine Crore Sixty Three lakh Only), except on account of payments under sub Article (i) above.

10.1.2.6 The TSP shall open a bank account at …… [Insert identified place or account] (the "Designated Account") for all payments to be made by the Long Term Transmission Customer to the TSP, and notify the Long Term Transmission Customer of the details of such account at least ninety (90) days before the Scheduled COD of the first Element to the Long Term Transmission Customer. The Long Term Transmission Customer shall, on the day of payment, notify the TSP of the payment made to the Designated Account. The Long Term Transmission Customer shall also designate a bank account at …… [Insert identified place] for payments to be made by the TSP to Long Term Transmission Customer and notify the TSP of the details of such account ninety (90) days before the Scheduled COD of the first Element.

10.2 Calculation of Monthly Transmission Charges:

The Monthly Transmission Charges for each Contract Year including Incentive & Penalty payment shall be calculated in accordance with the

provisions of Schedule 4 of this Agreement.

10.3 Rebate & Late Payment Surcharge:

10.3.1 Rebate: In case the Long Term Transmission Customer pays to the TSP through any mode of payment in respect of a Monthly Transmission Charge Invoice or Supplementary Bill, the following shall apply:

a. For payment of Invoices through any mode of payment, a Rebate of 2% shall be allowed on the Monthly Transmission Charge Invoice or Supplementary Bill for payments made in full within two Business Day of the receipt of the Invoice; or

b. For payment of Invoices subsequently, but within the Due Date, a Rebate of 1% shall be allowed on the payments made in full.

c. Applicable rate of Rebate at (a) and (b) above shall be based on the date on which the payment has been actually credited to the TSP's account. Any delay in transfer of money to the TSP's account, on account of a statutory holiday, public holiday, or any other reasons shall be to the account of the Long Term Transmission Customer provided that the Invoice is not submitted on the day immediately preceding a statutory holiday or public holiday.

d. No Rebate shall be payable on the bills raised on account of Change in Law relating to taxes, duties and cess;

Provided that if any Long Term Transmission Customer fails to pay a Monthly Transmission Charge Invoice/ Supplementary Bill or part thereof within and including the Due Date, the TSP shall recover such amount as per provisions of Article 10.4.3.1 (f).

10.3.2 Late Payment Surcharge: Any amount due from one Party to the other, pursuant to this Agreement and remaining unpaid for thirty (30) days after the Due Date, shall bear Late Payment Surcharge @ 1.25% per month on the unpaid amount. Such Late Payment Surcharge shall be calculated on simple rate basis and shall accrue from the Due Date until the amount due is actually received by the payee.

10.4 Disputed Bills, Default in payment by the Long Term Transmission Customer & Annual Reconciliation:

10.4.1 Disputed Invoices

10.4.1.1 If either Party does not question or dispute an Invoice within thirty (30) days of receiving it, the Invoice shall be considered correct, complete and conclusive between the Parties.

10.4.1.2 If either Party disputes any item or part of an item set out in any Invoice then that Party shall serve a notice (an "Invoice Dispute Notice") on the other Party setting out (i) the item or part of an item which is in dispute, (ii) its estimate of what such item or part of an item should be, (iii) and with all written material in support of its claim.

10.4.1.3 If the invoicing Party agrees to the claim raised in the Invoice Dispute Notice issued pursuant to Article 10.4.1.2, the invoicing Party shall revise such Invoice within seven (7) days of receiving such notice from the disputing Party and if the disputing Party has already made the excess payment, the invoicing Party shall refund to the disputing Party, such excess amount within fifteen (15) days of receiving such notice. In such a case, the excess amount shall be refunded along with interest at the same rate as the Late Payment Surcharge, which shall be applied from the date on which such excess payment was made to the invoicing Party and up to and including the date on which such payment has been received as refund.

10.4.1.4 If the invoicing Party does not agree to the claim raised in the Invoice Dispute Notice issued pursuant to Article 10.4.1.2, it shall, within fifteen (15) days of receiving the Invoice Dispute Notice, furnish a notice to the disputing Party providing (i) reasons for its disagreement; (ii) its estimate of what the correct amount should be; and (iii) all written material in support of its counter-claim.

10.4.1.5 Upon receipt of notice of disagreement to the Invoice Dispute Notice under Article 10.4.1.4, authorised representative(s) or a director of the board of directors/member of board of each Party shall meet and make best endeavours to amicably resolve such Dispute within fifteen (15) days of receiving such notice of disagreement to the Invoice Dispute Notice.

10.4.1.6 If the Parties do not amicably resolve the dispute within fifteen (15) days of receipt of notice of disagreement to the Invoice Dispute Notice pursuant to Article 10.4.1.4, the matter shall be referred to Appropriate

Commission for Dispute resolution in accordance with Article 16.

10.4.1.7 If a Dispute regarding a Monthly Transmission Charge Invoice or a Supplementary Invoice is settled pursuant to Article 10.3.1 or by Dispute resolution mechanism provided in this Agreement in favour of the Party that issues the Invoice Dispute Notice, the other Party shall refund the amount, if any incorrectly charged and collected from the disputing Party or pay as required, within five (5) days of the Dispute either being amicably resolved by the Parties pursuant to Article 10.4.1.5 or settled by Dispute resolution mechanism, along with interest (at the same rate as Late Payment Surcharge) or Late Payment Surcharge from the date on which such payment had been made to the invoicing Party or the date on which such payment was originally due, as may be applicable.

10.4.1.8 For the avoidance of doubt, it is clarified that despite a Dispute regarding an Invoice, the concerned Long Term Transmission Customer shall, without prejudice to its right to Dispute, be under an obligation to make payment, of the lower of (a) an amount equal to simple average of last three (3) months Invoices (being the undisputed portion of such three months Invoices) and (b) Monthly Invoice which is being disputed, provided such Monthly Invoice has been raised in accordance with this Agreement.

10.4.2 Payment of Supplementary Bill

10.4.2.1 Either Party may raise a bill on the other Party ("Supplementary Bill") for payment on account of:

i. adjustments (if any) required by the Regional Energy Account / State Energy Account (as the case may be); or

ii. quarterly or annual reconciliation as per Article 10.4.5; or

iii. Change in Law as provided in Article 12,

and such Bill shall be paid by the other Party.

10.4.3 Payment Security Mechanism:

10.4.3.1 Establishment of Letter of Credit:

(a) Not later than one (1) Month prior to the Scheduled COD of the

first Element of the Project, each Long Term Transmission Customer shall, through a scheduled bank, open a Letter of Credit in favour of the TSP, to be made operative from a date prior to the Due Date of its first Monthly Transmission Charge Invoice under this Agreement and shall be renewed annually.

(b) The draft of the proposed Letter of Credit shall be provided by each Long Term Transmission Customer to the TSP not later than the Financial Closure of the Project and shall be mutually agreed between the Parties.

(c) The Letter of Credit shall have a term of twelve (12) Months and shall be for an amount:

i. for the first Contract Year or for each subsequent Contract Year, equal to one point one (1.1) times the estimated average Monthly Transmission Charges based on Target Availability of the Elements or Project with Scheduled COD in such Contract Year, as the case may be;

ii. Provided that, the TSP shall not make any drawl before the Due Date and shall not make more than one drawal in a month.

Provided further that if at any time, such Letter of Credit amount falls short of the amount specified in Article 10.4.3.1, otherwise than by reason of drawal of such Letter of Credit by the TSP, the relevant Long Term Transmission Customer shall restore such shortfall within seven (7) days.

(d) Long Term Transmission Customer shall cause the scheduled bank issuing the Letter of Credit to intimate the TSP, in writing regarding establishing of such Letter of Credit.

(e) In case of drawal of the Letter of Credit by the TSP in accordance with the terms of this Article 10.4.3.1, the amount of the Letter of Credit shall be reinstated within seven (7) days from the date of such drawal.

(f) If any Long Term Transmission Customer fails to pay a Monthly Transmission Charge Invoice / Supplementary Bill or part thereof within and including the Due Date, then, unless an Invoice

Dispute Notice is received by the TSP as per the provisions of Article 10.4.1.2, the TSP may draw upon the Letter of Credit, and accordingly the bank shall pay without any reference or instructions from the Long Term Transmission Customer, an amount equal to such Monthly Transmission Charge Invoice/Supplementary Bill or part thereof plus Late Payment Surcharge, if applicable, in accordance with Article 10.3.2 above, by presenting to the scheduled bank issuing the Letter of Credit, the following documents:

i. a copy of the Monthly Transmission Charge Invoice/Supplementary Bill which has remained unpaid by such Long Term Transmission Customer;

ii. a certificate from the TSP to the effect that the Invoice at item (i) above, or specified part thereof, is in accordance with the Agreement and has remained unpaid beyond the Due Date; and

iii. calculations of applicable Late Payment Surcharge, if any.

Provided that failure on the part of the TSP to present the documents for negotiation of the Letter of Credit shall not attract any Late Payment Surcharge on the Long Term Transmission Customer.

(g) Each Long Term Transmission Customer shall ensure that the Letter of Credit shall be renewed not later than thirty (30) days prior to its expiry.

(h) All costs relating to opening and maintenance of the Letter of Credit shall be borne by the Long Term Transmission Customer. However, the Letter of Credit negotiation charges shall be borne and paid by the TSP.

(i) If a Long Term Transmission Customer fails to pay (with respect to a Monthly Bill or Supplementary Bill) an amount exceeding thirty percent (30%) of the most recent undisputed Monthly Bill, for a period of seven (7) days after the Due Date and the TSP is unable to recover the amount outstanding to the TSP through the Letter of Credit,

(i) the TSP shall issue a notice to such Long Term Transmission Customer within seven (7) days from such period, with a copy to each of the other Long Term Transmission Customer, highlighting the nonpayment of such amount by such Long Term Transmission Customer;

(ii) If such Long Term Transmission Customer still fails to pay such amount within a period of thirty (30) days after the issue of notice by TSP as mentioned in (i) above, the TSP shall approach the RLDC / SLDC (as the case may be) requesting for the alteration of the schedule of dispatch of the lowest cost power of such Long Term Transmission Customer from the Central Generating Stations/ State Generating Stations (as the case may be), and the RLDC / SLDC shall continue to reschedule the lowest cost power till all the dues of the TSP are recovered;

- Provided that in this case, the quantum of electricity and the corresponding period in which it would be rescheduled for dispatch shall be corresponding to the amount of default. This electricity will then be dispatched to other utilities by the concerned RLDC/SLDC, as the case may be, during the peak hours, i.e., 7pm to 10 pm. The price of this electricity will be determined as per the UI rate;

- Provided further that the revenue from such diverted power would be used to pay the dues first of the generating company (which would include the capacity charges as well as the energy charges) and the remainder would be available for covering the default amount and the balance (if any), after recovering both the charges, would be paid to the defaulting Long Term Transmission Customer.

10.4.4 Payment Intimation

Long Term Transmission Customer shall remit all amounts due under an Invoice raised by the TSP to the TSP's account by the Due Date and notify the TSP of such remittance on the same day. Similarly, the TSP shall pay all amounts due under an Invoice raised by Long Term Transmission Customer by the Due Date to concerned Long Term Transmission Customer's account and notify such Long Term Transmission Customer of such payment on the same day.

10.4.5 Quarterly and Annual Reconciliation

10.4.5.1 Parties acknowledge that all payments made against Monthly Bill(s) and Supplementary Bill(s) shall be subject to quarterly reconciliation at the beginning of the following quarter of each Contract Year and annual reconciliation at the end of each Contract Year to take into account Regional Energy Account/ State Energy Account, adjustments in Transmission Charges payments, Rebates, Late Payment Surcharge, Incentive, Penalty, or any other reasonable circumstance as may be mutually agreed between the Parties.

10.4.5.2 The Parties, therefore, agree that as soon as all such data in respect of any quarter of a Contract Year or a full Contract Year, as the case may be, is available and has been finally verified and adjusted, the TSP and each Long Term Transmission Customer shall jointly sign such reconciliation statement. Within fifteen (15) days of signing of a reconciliation statement, the TSP or Long Term Transmission Customer, as the case may be, shall raise a Supplementary Bill for the payments as may be due as a result of reconciliation for the relevant quarter/ Contract Year and shall make payment of such Supplementary Bill for the adjustments in Transmission Charges payments for the relevant quarter/Contract Year.

10.4.5.3 Interest / Late Payment Surcharge shall be payable in such a case from the date on which such payment had been made to the invoicing Party or the date on which any payment was originally due, as may be applicable. Any dispute with regard to the above reconciliation shall be dealt with in accordance with the provisions of Article 16.

ARTICLE: 11

11 FORCE MAJEURE

11.1 Definitions

11.1.1 The following terms shall have the meanings given hereunder.

11.2 Affected Party

11.2.1 An Affected Party means any Party whose performance has been affected by an event of Force Majeure.

11.2.2 Any event of Force Majeure shall be deemed to be an event of Force Majeure affecting the TSP only if the Force Majeure event affects and results in, late delivery of machinery and equipment for the Project or construction, completion, commissioning of the Project by Scheduled COD and/or operation thereafter;

11.3 Force Majeure

A 'Force Majeure' means any event or circumstance or combination of events and circumstances including those stated below that wholly or partly prevents or unavoidably delays an Affected Party in the performance of its obligations/ roles under this Agreement, but only if and to the extent that such events or circumstances are not within the reasonable control, directly or indirectly, of the Affected Party and could not have been avoided if the Affected Party had taken reasonable care or complied with Prudent Utility Practices:

(a) **Natural Force Majeure Events:**

i. act of God, including, but not limited to drought, fire and explosion (to the extent originating from a source external to the Site), earthquake, volcanic eruption, landslide, flood, cyclone, typhoon, tornado, or exceptionally adverse weather conditions, which are in excess of the statistical measures for the last hundred (100) years; and

ii. epidemic/ pandemic notified by Indian Governmental Instrumentality.

(b) **Non-Natural Force Majeure Events :**

i. Direct Non–Natural Force Majeure Events

- Nationalization or compulsory acquisition by any Indian Governmental Instrumentality of any material assets or rights of the Affected Party; or

- the unlawful, unreasonable or discriminatory revocation of, or refusal to renew, any Consents, Clearances and Permits required by the Affected Party to perform their obligations/ roles under the RFP Project Documents or any unlawful, unreasonable or discriminatory refusal to grant any other Consents, Clearances and Permits required for the development/ operation of the Project, provided that a Competent Court of Law declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down; or

- any other unlawful, unreasonable or discriminatory action on the part of an Indian Governmental Instrumentality which is directed against the Project, provided that a Competent Court of Law declares the action to be unlawful, unreasonable and discriminatory and strikes the same down.

ii. Indirect Non - Natural Force Majeure Events

- act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, terrorist or military action; or

- radio active contamination or ionising radiation originating from a source in India or resulting from any other Indirect Non Natural Force Majeure Event mentioned above, excluding circumstances where the source or cause of contamination or radiation is brought or has been brought into or near the Site by the Affected Party or those employed or engaged by the Affected Party; or

- industry-wide strikes and labour disturbances, having a nationwide impact in India.

11.4 Force Majeure Exclusions

11.4.1 Force Majeure shall not include (i) any event or circumstance which is within the reasonable control of the Parties and (ii) the following conditions, except to the extent that they are consequences of an event of Force Majeure:

a) Unavailability, late delivery, or changes in cost of the machinery, equipment, materials, spare parts etc. for the Project;

b) Delay in the performance of any Contractors or their agents;

c) Non-performance resulting from normal wear and tear typically experienced in transmission materials and equipment;

d) Strikes or labour disturbance at the facilities of the Affected Party;

e) Insufficiency of finances or funds or the Agreement becoming onerous to perform; and

f) Non-performance caused by, or connected with, the Affected Party's:

i. negligent or intentional acts, errors or omissions;

ii. failure to comply with an Indian Law; or

iii. breach of, or default under this Agreement or any Project Documents.

g) Any error or omission in the survey report provided by BPC during the bidding process.

11.5 Notification of Force Majeure Event

11.5.1 The Affected Party shall give notice to the other Party of any event of Force Majeure as soon as reasonably practicable, but not later than seven (7) days after the date on which such Party knew or should reasonably have known of the commencement of the event of Force Majeure. If an event of Force Majeure results in a breakdown of communications rendering it unreasonable to give notice within the applicable time limit specified herein, then the Party claiming Force Majeure shall give such notice as soon as reasonably practicable after reinstatement of communications, but not later than one (1) day after such reinstatement.

Provided that, such notice shall be a pre-condition to the Affected Party's entitlement to claim relief under this Agreement. Such notice shall include full particulars of the event of Force Majeure, its effects on the Party claiming relief and the remedial measures proposed. The Affected Party shall give the other Party regular reports on the progress of those remedial measures and such other information as the other Party may reasonably request about the Force Majeure.

11.5.2 The Affected Party shall give notice to the other Party of (i) the cessation of the relevant event of Force Majeure; and (ii) the cessation of the effects of such event of Force Majeure on the performance of its rights or obligations/ roles under this Agreement, as soon as practicable after becoming aware of each of these cessations.

11.6 Duty to perform and duty to mitigate

To the extent not prevented by a Force Majeure Event, the Affected Party shall continue to perform its obligations/ roles as provided in this Agreement. The Affected Party shall use its reasonable efforts to mitigate the effect of any event of Force Majeure as soon as practicable.

11.7 Available Relief for a Force Majeure Event

Subject to this Article 11,

a) no Party shall be in breach of its obligations/ roles pursuant to this Agreement to the extent that the performance of its obligations/ roles was prevented, hindered or delayed due to a Force Majeure Event;

b) each Party shall be entitled to claim relief for a Force Majeure Event affecting its performance in relation to its obligations/ roles under Articles 3.3.4, 4.4.2 and 6.3.1 of this Agreement.

c) For the avoidance of doubt, it is clarified that the computation of Availability of the Element(s) under outage due to Force Majeure Event, as per Article 11.3 affecting the TSP shall be as per Appendix II to III of Madhya Pradesh Electricity Regulatory Commission (Terms and Conditions for Determination of Transmission Tariff) (Revision-IV) Regulations, 2020 as on Bid Deadline. For the event(s) for which the Element(s) is/are deemed to be available as per Appendix II to III of Madhya Pradesh Electricity Regulatory Commission (Terms and Conditions for Determination of Transmission Tariff) (Revision-IV) Regulations, 2020, then the Transmission Charges, as applicable to such Element(s), shall be payable as per Schedule 4, for the duration of such event(s).

d) For so long as the TSP is claiming relief due to any Force

Majeure Event under this Agreement, the Long Term Transmission Customer may, if it so desires, from time to time on one (1) day notice, inspect the Project and the TSP shall provide the Long Term Transmission Customer's personnel with access to the Project to carry out such inspections.

e) For avoidance of doubt, the TSP acknowledges that for extension of Scheduled COD a period up to one hundred eighty (180) days due to Force Majeure event, no compensation on the grounds such as interest cost, incident expenditure, opportunity cost will be made to the TSP. However, if Scheduled COD is extended beyond a period of one hundred eighty (180) days due to Force Majeure event, the TSP will be allowed to recover the interest cost during construction corresponding to the period exceeding one hundred eighty (180) days by adjustment in the Transmission Charges in accordance with Schedule 9.

ARTICLE: 12

12 CHANGE IN LAW

12.1 Change in Law

12.1.1 Change in Law means the occurrence of any of the following after the Bid Deadline resulting into any additional recurring / non-recurring expenditure by the TSP or any savings of the TSP:

- the enactment, coming into effect, adoption, promulgation, amendment, modification or repeal (without re-enactment or consolidation) in India, of any Law, including rules and regulations framed pursuant to such Law, subject to the provisions under Article 12.1.2;
- a change in the interpretation or application of any Law by any Indian Governmental Instrumentality having the legal power to interpret or apply such Law, or any Competent Court of Law;
- the imposition of a requirement for obtaining any Consents, Clearances and Permits which was not required earlier;
- a change in the terms and conditions prescribed for obtaining any Consents, Clearances and Permits or the inclusion of any new terms or conditions for obtaining such Consents, Clearances and Permits;
- any change in the licensing regulations of the State Commission, under which the Transmission License for the Project was granted if made applicable by such State Commission to the TSP;
- change in wind zone; or
- any change in tax or introduction of any tax made applicable for providing Transmission Service by the TSP as per the terms of this Agreement.

12.1.2 Notwithstanding anything contained in this Agreement, Change in Law shall not cover any change:

a) Taxes on corporate income; and

b) Withholding tax on income or dividends distributed to the shareholders of the TSP.

12.2 Relief for Change in Law

12.2.1 During Construction Period, the impact of increase/decrease in the cost of the Project on the Transmission Charges shall be governed by the formula given in Schedule 9 of this Agreement.

12.2.2 During the Operation Period:

During the operation period, if as a result of Change in Law, the TSP suffers or is benefited from a change in costs or revenue, the aggregate financial effect of which exceeds 0.30% (zero point three percent) of the Annual Transmission Charges in aggregate for a Contract Year, the TSP may notify so to the Long Term Transmission Customer and propose amendments to this Agreement so as to place the TSP in the same financial position as it would have enjoyed had there been no such Change in Law resulting in change in costs or revenue as aforesaid.

12.2.3 For any claims made under Articles 12.2.1 and 12.2.2 above, the TSP shall provide to the Long Term Transmission Customer documentary proof of such increase / decrease in cost of the Project / revenue for establishing the impact of such Change in Law.

In cases where Change in Law results in decrease of cost and it comes to the notice of Long Term Transmission Customer that TSP has not informed Long Term Transmission Customer about such decrease in cost, Long Term Transmission Customer may initiate appropriate claim.

12.3 **Notification of Change in Law**:

12.3.1 If the TSP is affected by a Change in Law in accordance with Article 12.1 and wishes to claim relief for such Change in Law under this Article 12, it shall give notice to Long Term Transmission Customer of such Change in Law as soon as reasonably practicable after becoming aware of the same.

12.3.2 The TSP shall also be obliged to serve a notice to the Long Term Transmission Customer even when it is beneficially affected by a Change in Law.

12.3.3 Any notice served pursuant to Articles 12.3.1 and 12.3.2 shall provide, amongst other things, precise details of the Change in Law and its estimated impact on the TSP.

12.4 Payment on account of Change in Law

12.4.1 The payment for Change in Law shall be through a separate Bill. However, in case of any change in Monthly Transmission Charges by reason of Change in Law, as determined in accordance with this Agreement, the Bills to be raised by the Long Term Transmission Customer after such change in Transmission Charges shall appropriately reflect the changed Monthly Transmission Charges.

ARTICLE: 13

13 EVENTS OF DEFAULT AND TERMINATION

13.1 TSP's Event of Default

The occurrence and continuation of any of the following events shall constitute a TSP Event of Default, unless any such TSP Event of Default occurs as a result of any non-fulfilment of its obligations as prescribed under this Agreement by the Long Term Transmission Customer or a Force Majeure Event:

a. After having taken up the construction of the Project, the abandonment by the TSP or the TSP's Contractors of the construction of the Project for a continuous period of two (2) months and such default is not rectified within thirty (30) days from the receipt of notice from the Long Term Transmission Customer in this regard;

b. The failure to commission any Element of the Project by the date falling six (6) months after its Scheduled COD unless extended by Long Term Transmission Customer as per provisions of this Agreement;

c. If the TSP:

i. assigns, mortgages or charges or purports to assign, mortgage or charge any of its assets or rights related to the Project in contravention of the provisions of this Agreement; or

ii. transfers or novates any of its obligations pursuant to this Agreement, in a manner contrary to the provisions of this Agreement;

Except where such transfer is in pursuance of a Law and

- it does not affect the ability of the transferee to perform, and such transferee has the financial and technical capability to perform, its obligations under this Agreement;
- is to a transferee who assumes such obligations under the Project and this Agreement remains effective with respect to the transferee;

d. If:

i. The TSP becomes voluntarily or involuntarily the subject of any bankruptcy or insolvency or winding up proceedings and such proceedings remain uncontested for a period of thirty (30) days; or

ii. any winding up or bankruptcy or insolvency order is passed against the TSP; or

iii. the TSP goes into liquidation or dissolution or a receiver or any similar officer is appointed over all or substantially all of its assets or official liquidator is appointed to manage its affairs, pursuant to Law,

Provided that a dissolution or liquidation of the TSP will not be a TSP's Event of Default, where such dissolution or liquidation of the TSP is for the purpose of a merger, consolidation or reorganization with the prior approval of the State Commission as per the provisions of Madhya Pradesh Electricity Regulatory Commission (Procedure of Application for License) regulations, 2004 and "The Conditions of Transmission License for Transmission Licensee (including deemed licensee)" as amended from time to time; or

e. Failure on the part of the TSP to comply with the provisions of Article 19.1 of this Agreement; or

f. the TSP repudiates this Agreement and does not rectify such breach even within a period of thirty (30) days from a notice from the Long Term Transmission Customer in this regard; or

g. after Commercial Operation Date of the Project, the TSP fails to achieve monthly Target Availability of 98%, for a period of six (6) consecutive months or within a non-consecutive period of six (6) months within any continuous aggregate period of eighteen(18) months except where the Availability is affected by Force Majeure Events as per Article 11; or

h. any of the representations and warranties made by the TSP in Article 17 of this Agreement being found to be untrue or inaccurate. Further, in addition to the above, any of the undertakings submitted by the Selected Bidder at the time of submission of the Bid being found to be breached or inaccurate, including but not limited to undertakings from its

Parent Company / Affiliates related to the minimum equity obligation; or

i. the TSP fails to complete / fulfil all the activities / conditions within the specified period as per Article 3; or

j. except for the reasons solely attributable to Long Term Transmission Customer, the TSP is in material breach of any of its obligations under this Agreement and such material breach is not rectified by the TSP within thirty (30) days of receipt of notice in this regard from the Long Term Transmission Customer ; or

k. the TSP fails to take the possession of the land required for location specific substations, switching stations or HVDC terminal or inverter stations and / or fails to pay the requisite price to the parties and / or any State Government authority from whom the land is acquired, within twelve (12) months from the Effective Date.

13.2 Termination Procedure for TSP Event of Default

a. Upon the occurrence and continuance of any TSP's Event of Default under Article 13.1 the Long Term Transmission Customer may serve notice on the TSP, with a copy to the Government of Madhya Pradesh, STU and the Lenders' Representative, of their intention to terminate this Agreement (a "Long Term Transmission Customer's Preliminary Termination Notice"), which shall specify in reasonable detail, the circumstances giving rise to such Long Term Transmission Customer's Preliminary Termination Notice.

b. Following the issue of a Long Term Transmission Customer's Preliminary Termination Notice, the Consultation Period shall apply and would be for the Parties to discuss as to what steps shall be taken with a view to mitigate the consequences of the relevant Event of Default having regard to all the circumstances.

c. During the Consultation Period, the Parties shall, save as otherwise provided in this Agreement, continue to perform their respective obligations/ roles under this Agreement, and the TSP shall not remove any material, equipment or any part of the Project, without prior consent of the Long Term Transmission Customer.

Following the expiry of the Consultation Period, unless the Parties shall have otherwise agreed to the contrary or the circumstances

giving rise to Long Term Transmission Customer's Preliminary Termination Notice shall have ceased to exist or shall have been remedied, this Agreement may be terminated by the Long Term Transmission Customer by giving a Termination Notice to the TSP, in writing, of at least seven (7) days, with a copy to Government of Madhya Pradesh, STU and the Lenders' Representative in order to enable the Lenders to exercise right of substitution in accordance with Article 15.3 of this Agreement.

Further, the Long Term Transmission Customer may also initiate proceedings to blacklist the TSP & its Affiliates from participation in any RFP issued by BPCs for a period of 5 years.

13.3 Procedure for Long Term Transmission Customer's non-fulfilment of Role

a. Upon the Long Term Transmission Customer not being able to fulfil its role under Article 4.2, the TSP may serve notice on the Long Term Transmission Customer, with a copy to Government of Madhya Pradesh, STU and the Lenders' Representative (a "TSP's Preliminary Notice"), which notice shall specify in reasonable detail the circumstances giving rise to such non-fulfilment of role by the Long Term Transmission Customer.

b. Following the issue of a TSP's Preliminary Notice, the Consultation Period shall apply.

c. The Consultation Period would be for the Parties to discuss as to what steps shall be taken with a view to mitigate the consequences of the relevant non-fulfilment of role by the Long Term Transmission Customer including giving time extension to TSP, having regard to all the circumstances.

d. During the Consultation Period, both Parties shall, save as otherwise provided in this Agreement, continue to perform their respective obligations/ roles under this Agreement.

13.4 Termination due to Force Majeure

13.4.1 In case the Parties could not reach an agreement pursuant to Articles 3.3.4 and 4.4.2 of this Agreement and the Force Majeure Event or its effects continue to be present, the Long Term Transmission Customer shall have the right to cause termination of the Agreement. In case of such termination, the Contract Performance Guarantee shall be returned to the TSP as per the provisions of Article 6.5.1.

13.4.2 In case of termination of this Agreement, the TSP shall provide to the Long Term Transmission Customer the full names and addresses of its Contractors as well as complete designs, design drawings, manufacturing drawings, material specifications and technical information, as required by the Long Term Transmission Customer within thirty (30) days of Termination Notice.

13.5 Termination or amendment due to non-requirement of any Element or Project during construction

13.5.1 In case any Element or Project, which is under construction, is no longer required due to any reason whatsoever, the Long Term Transmission Customer may issue a notice to this effect to the TSP.

13.5.2 Long Term Transmission Customer may also issue notice to the TSP seeking their response to the proposed termination/ amendment (as the case may be) of the Agreement. The Long Term Transmission Customer shall issue copy of such notice to Lenders. In the notice, Long Term Transmission Customer shall also include an assessment of the physical progress made by TSP in the Element/ Project (as the case may be) that is no longer required.

13.5.3 The TSP shall neither carry out further investment nor carry out any work on the Element/ Project (as the case may be) that is no longer required after delivery of the notice.

13.5.4 After taking into account the comments of the TSP, the Long Term Transmission Customer may terminate the Agreement or amend it if both Parties agree to the amendment.

13.6 Revocation of the Transmission License

13.6.1 The State Commission may, as per the provisions of the Electricity Act, 2003, revoke the Transmission License of the Licensee. Further, in such a case, the Agreement shall be deemed to have been terminated.

13.7 Termination Payment

13.7.1 If Agreement is terminated on account of Force Majeure Events, non-requirement of any Element or Project during Construction, Long Term Transmission Customer's non-fulfilment of Role & TSP's Event of Default, the TSP shall be entitled for Termination Payment equivalent to valuation of Project Assets. Upon payment, the Long Term Transmission Customer shall take over the Project Assets.

ARTICLE: 14

14 LIABILITY AND INDEMNIFICATION

14.1 Indemnity

14.1.1 The TSP shall indemnify, defend and hold the Long Term Transmission Customer harmless against:

(a) any and all third party claims, actions, suits or proceedings against the Long Term Transmission Customer for any loss of or damage to property of such third party, or death or injury to such third party, arising out of a breach by the TSP of any of its obligations under this Agreement, except to the extent that any such claim, action, suit or proceeding has arisen due to a negligent act or omission, breach of this Agreement or non-fulfilment of statutory duty on the part of Long Term Transmission Customer ; and

(b) any and all losses, damages, costs and expenses including legal costs, fines, penalties and interest actually suffered or incurred by the Long Term Transmission Customer from third party claims arising by reason of:

i. a breach by the TSP of any of its obligations under this Agreement, (provided that this Article 14 shall not apply to such breaches by the TSP, for which specific remedies have been provided for under this Agreement) except to the extent that any such losses, damages, costs and expenses including legal costs, fines, penalties and interest (together to constitute “Indemnifiable Losses”) has arisen due to a negligent act or omission, breach of this Agreement or non-fulfilment of statutory duty on the part of the Long Term Transmission Customer , or

ii. any of the representations and warranties of the TSP under this Agreement being found to be inaccurate or untrue.

14.1.2 The Long Term Transmission Customer shall indemnify, defend and hold the TSP harmless against:

(a) any and all third party claims, actions, suits or proceedings against the TSP, for any loss of or damage to property of such third party, or death or injury to such third party, arising out of any material breach by the Long Term Transmission Customer of any of their roles under this Agreement, except to the extent that any such claim, action, suit or proceeding has arisen due to a negligent act or omission, breach

of this Agreement or breach of statutory duty on the part of the TSP, its Contractors, servants or agents; and

(b) any and all losses, damages, costs and expenses including legal costs, fines, penalties and interest ('Indemnifiable Losses') actually suffered or incurred by the TSP from third party claims arising by reason of:

i. any material breach by the Long Term Transmission Customer of any of its roles under this Agreement (provided that, this Article 14 shall not apply to such breaches by the Long Term Transmission Customer , for which specific remedies have been provided for under this Agreement), except to the extent that any such Indemnifiable Losses have arisen due to a negligent act or omission, breach of this Agreement or breach of statutory duty on the part of the TSP, its Contractors, servants or agents or

ii. any of the representations and warranties of the Long Term Transmission Customer under this Agreement being found to be inaccurate or untrue.

14.2 Patent Indemnity:

14.2.1

(a) The TSP shall, subject to the Long Term Transmission Customer's compliance with Article 14.2.1 (b), indemnify and hold harmless the Long Term Transmission Customer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Long Term Transmission Customer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Agreement by reason of the setting up of the Project by the TSP.

Such indemnity shall not cover any use of the Project or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Agreement, any infringement resulting from the misuse of the Project or any part thereof, or any products produced in association or combination with any other equipment, plant or materials not supplied by the TSP, pursuant to the Agreement.

(b) If any proceedings are brought or any claim is made against the Long Term

Transmission Customer arising out of the matters referred to in Article 14.2.1(a), the Long Term Transmission Customer shall promptly give the TSP a notice thereof, and the TSP shall at its own expense take necessary steps and attend such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. The TSP shall promptly notify the Long Term Transmission Customer of all actions taken in such proceedings or claims.

(c) If the TSP fails to notify the Long Term Transmission Customer within twenty-eight (28) days after receipt of such notice from the Long Term Transmission Customer under Article 14.2.1(b) above, that it intends to attend any such proceedings or claim, then the Long Term Transmission Customer shall be free to attend the same on their own behalf at the cost of the TSP. Unless the TSP has so failed to notify the Long Term Transmission Customer within the twenty eight (28) days period, the Long Term Transmission Customer shall make no admission that may be prejudicial to the defence of any such proceedings or claims.

(d) The Long Term Transmission Customer shall, at the TSP's request, afford all available assistance to the TSP in attending to such proceedings or claim, and shall be reimbursed by the TSP for all reasonable expenses incurred in so doing.

14.2.2

(a) The Long Term Transmission Customer, subject to the TSP's compliance with Article 14.2.2(b) shall indemnify and hold harmless the TSP and its employees, officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs and expenses of whatsoever nature, including attorney's fees and expenses, which the TSP may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Agreement by reason of the setting up of the Project by the TSP.

(b) If any proceedings are brought or any claim is made against the TSP arising out of the matters referred to in Article 14.2.2 (a) the TSP shall promptly give the Long Term Transmission Customer a notice thereof, and the Long Term Transmission Customer shall at its own expense take necessary steps and attend such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. The Long Term Transmission Customer shall promptly notify the TSP of all actions taken in such proceedings or

claims.

(c) If the Long Term Transmission Customer fails to notify the TSP within twenty-eight (28) days after receipt of such notice from the TSP under Article 14.2.2(b) above, that it intends to attend any such proceedings or claim, then the TSP shall be free to attend the same on its own behalf at the cost of the Long Term Transmission Customer. Unless the Long Term Transmission Customer has so failed to notify the TSP within the twenty (28) days period, the TSP shall make no admission that may be prejudicial to the defence of any such proceedings or claim.

(d) The TSP shall, at the Long Term Transmission Customer request, afford all available assistance to the Long Term Transmission Customer in attending to such proceedings or claim, and shall be reimbursed by the Long Term Transmission Customer for all reasonable expenses incurred in so doing.

14.3 Monetary Limitation of liability

14.3.1 A Party ("Indemnifying Party") shall be liable to indemnify the other Party ("Indemnified Party") under this Article 14 for any indemnity claims made in a Contract Year only up to an amount of Rupees 1.93 Crores (Rs. One Crore Ninety Three Lakh Only)**.**

14.4 Procedure for claiming indemnity

14.4.1 Where the Indemnified Party is entitled to indemnification from the Indemnifying Party pursuant to Articles 14.1 or 14.2 the Indemnified Party shall promptly notify the Indemnifying Party of such claim, proceeding, action or suit referred to in Articles 14.1 or 14.2 in respect of which it is entitled to be indemnified. Such notice shall be given as soon as reasonably practicable after the Indemnified Party becomes aware of such claim, proceeding, action or suit. The Indemnifying Party shall be liable to settle the indemnification claim within thirty (30) days of receipt of the above notice.

Provided however that, if:

i. the Parties choose to contest, defend or litigate such claim, action, suit or proceedings in accordance with Article 14.4.3 below; and

ii. the claim amount is not required to be paid/deposited to such third party pending the resolution of the Dispute,

the Indemnifying Party shall become liable to pay the claim amount to

the Indemnified Party or to the third party, as the case may be, promptly following the resolution of the Dispute, if such Dispute is not settled in favour of the Indemnified Party.

14.4.2 The Indemnified Party may contest, defend and litigate a claim, action, suit or proceeding for which it is entitled to be indemnified under Articles 14.1 or 14.2 and the Indemnifying Party shall reimburse to the Indemnified Party all reasonable costs and expenses incurred by the Indemnified Party. However, such Indemnified Party shall not settle or compromise such claim, action, suit or proceedings without first getting the consent of the Indemnifying Party, which consent shall not be unreasonably withheld or delayed.

14.4.3 An Indemnifying Party may, at its own expense, assume control of the defence of any proceedings brought against the Indemnified Party if it acknowledges its obligation to indemnify such Indemnified Party, gives such Indemnified Party prompt notice of its intention to assume control of the defence, and employs an independent legal counsel at its own cost that is reasonably satisfactory to the Indemnified Party.

14.5 Limitation on Liability

14.5.1 Except as expressly provided in this Agreement, neither the TSP nor the Long Term Transmission Customer nor their respective officers, directors, agents, employees or Affiliates (including, officers, directors, agents or employees of such Affiliates), shall be liable or responsible to the other Party or its Affiliates including its officers, directors, agents, employees, successors, insurers or permitted assigns for incidental, indirect or consequential, punitive or exemplary damages, connected with or resulting from performance or non-performance of this Agreement, or anything done in connection herewith, including claims in the nature of lost revenues, income or profits (other than payments expressly required and properly due under this Agreement), any increased expense of, reduction in or loss of transmission capacity or equipment used therefore, irrespective of whether such claims are based upon breach of warranty, tort (including negligence, whether of the Long Term Transmission Customer, the TSP or others), strict liability, contract, breach of statutory duty, operation of law or otherwise.

14.5.2 The Long Term Transmission Customer shall have no recourse against any officer, director or shareholder of the TSP or any Affiliate of the TSP or any of its officers, directors or shareholders for such claims excluded under this Article. The TSP shall also have no recourse against any

officer, director or shareholder of the Long Term Transmission Customer, or any Affiliate of the Long Term Transmission Customer or any of its officers, directors or shareholders for such claims excluded under this Article.

14.6 Duty to Mitigate

The party entitled to the benefit of an indemnity under this Article 14 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the Party fails to take such measures, the other Party's liabilities shall be correspondingly reduced.

ARTICLE: 15

15 ASSIGNMENTS AND CHARGES

15.1 Assignments:

15.1.1 This Agreement shall be binding upon, and inure to the benefit of the Parties and their respective successors and permitted assigns. This Agreement shall not be assigned by any Party, except as provided in Article 15.3.

15.2 Permitted Charges:

15.2.1 Neither Party shall create or permit to subsist any encumbrance over all or any of its rights and benefits under this Agreement.

15.2.2 However, the TSP may create any encumbrance over all or part of the receivables, or the Project Assets of the Project in favour of the Lenders or the Lenders' Representative on their behalf, as security for amounts payable under the Financing Agreements and any other amounts agreed by the Parties.

Provided that:

i. the Lenders or the Lenders' Representative on their behalf shall have entered into the Financing Agreements and agreed in writing to the provisions of this Agreement; and

ii. any encumbrance granted by the TSP in accordance with this Article 15.2.2 shall contain provisions pursuant to which the Lenders or the Lender's Representative on their behalf agrees unconditionally with the TSP to release from such encumbrances upon payment by the TSP to the Lenders of all amounts due under the Financing Agreements.

15.2.3 Article 15.2.1 does not apply to:

a. liens arising by operation of law (or by an agreement evidencing the same) in the ordinary course of the TSP developing and operating the Project;

b. pledges of goods, the related documents of title and / or other related documents, arising or created in the ordinary course of the TSP developing and operating the Project; or

c. security arising out of retention of title provisions in relation to goods acquired in the ordinary course of the TSP developing and operating the Project.

15.3 Substitution Rights of the Lenders

15.3.1 The TSP would need to operate and maintain the Project under the provisions of this Agreement and cannot assign the Transmission License or transfer the Project or part thereof to any person by sale, lease, exchange or otherwise, without the prior approval of the Long Term Transmission Customer.

15.3.2 However, in the case of default by the TSP in debt repayments or in the case of default by the TSP as per Article 13 of this Agreement during the debt repayments, the State Commission may, on an application from the Lenders, assign the Transmission License to the nominee of the Lenders subject to the fulfilment of the qualification requirements and provisions of the Madhya Pradesh Electricity Regulatory Commission (Procedure of Application for License) Regulations, 2004 and "The Conditions of Transmission License for Transmission Licensee (including deemed licensee)" and as amended from time to time.

ARTICLE: 16

16 GOVERNING LAW AND DISPUTE RESOLUTION

16.1 Governing Law:

This Agreement shall be governed by and construed in accordance with the Laws of India. Any legal proceedings in respect of any matters, claims or disputes under this Agreement shall be under the jurisdiction of appropriate courts in Delhi.

16.2 Amicable Settlement:

16.2.1 Either Party is entitled to raise any claim, dispute or difference of whatever nature arising under, out of or in connection with this Agreement, including its existence or validity or termination or whether during the execution of the Project or after its completion and whether prior to or after the abandonment of the Project or termination or breach of the Agreement by giving a written notice to the other Party, which shall contain:

(i) a description of the Dispute;

(ii) the grounds for such Dispute; and

(iii) all written material in support of its claim.

16.2.2 The other Party shall, within thirty (30) days of issue of notice issued under Article 16.2.1, furnish:

(i) counter-claim and defences, if any, regarding the Dispute; and

(ii) all written material in support of its defences and counter-claim.

16.2.3 Within thirty (30) days of issue of notice by the Party pursuant to Article 16.2.1, if the other Party does not furnish any counter claim or defense under Article 16.2.2, or thirty (30) days from the date of furnishing counter claims or defence by the other Party, both the Parties to the Dispute shall meet to settle such Dispute amicably. If the Parties fail to resolve the Dispute amicably within thirty (30) days from the later of the dates mentioned in this Article 16.2.3, the Dispute shall be referred for dispute resolution in accordance with Article 16.3.

16.3 Dispute Resolution:

All Disputes shall be adjudicated by the State Commission.

16.4 Parties to Perform Obligations:

Notwithstanding the existence of any Dispute and difference referred to the State Commission as provided in Article 16.3 and save as the State Commission may otherwise direct by a final or interim order, the Parties hereto shall continue to perform their respective obligations/ roles (which are not in dispute) under this Agreement.

ARTICLE: 17

17 REPRESENTATION AND WARRANTIES

17.1 Representation and warranties of the Long Term Transmission Customer

17.1.1 The Long Term Transmission Customer hereby represents and warrants to and agrees with the TSP as follows and acknowledges and confirms that the TSP is relying on such representations and warranties in connection with the transactions described in this Agreement:

a. It has all requisite powers and authority to execute and consummate this Agreement;

b. This Agreement is enforceable against the Long Term Transmission Customer in accordance with its terms;

c. The consummation of the transactions contemplated by this Agreement on the part of Long Term Transmission Customer will not violate any provision of nor constitute a default under, nor give rise to a power to cancel any charter, mortgage, deed of trust or lien, lease, agreement, license, permit, evidence of indebtedness, restriction, or other contract to which the Long Term Transmission Customer is a Party or to which the Long Term Transmission Customer is bound, which violation, default or power has not been waived;

17.2 Representation and Warranties of the TSP:

17.2.1 The TSP hereby represents and warrants to and agrees with the Long Term Transmission Customer as follows and acknowledges and confirms that the Long Term Transmission Customer is relying on such representations and warranties in connection with the transactions described in this Agreement:

a. It has all requisite powers and has been duly authorized to execute and consummate this Agreement;

b. This Agreement is enforceable against it, in accordance with its terms;

c. The consummation of the transactions contemplated by this Agreement on the part of the TSP will not violate any provision of nor constitute a default under, nor give rise to a power to cancel any charter, mortgage, deed of trust or lien, lease, agreement, license, permit, evidence of indebtedness, restriction, or other contract to

which the TSP is a Party or to which the TSP is bound which violation, default or power has not been waived;

d. The TSP is not insolvent and no insolvency proceedings have been instituted, nor threatened or pending by or against the TSP;

e. There are no actions, suits, claims, proceedings or investigations pending or, to the best of the TSP's knowledge, threatened in writing against the TSP at law, in equity, or otherwise, and whether civil or criminal in nature, before or by, any court, commission, arbitrator or governmental agency or authority, and there are no outstanding judgments, decrees or orders of any such courts, commission, arbitrator or governmental agencies or authorities, which materially adversely affect its ability to execute the Project or to comply with its obligations under this Agreement.

17.2.2 The TSP makes all the representations and warranties above to be valid as on the Effective Date of this Agreement.

ARTICLE: 18

18 INDEPENDENT ENGINEER

18.1 Appointment of Independent Engineer

The Long Term Transmission Customer shall appoint an agency/ company as Independent Engineer as per framework provided in the Guidelines for Encouraging Competition in Development of Transmission Projects for selection of Independent Engineer.

18.2 Roles and functions of Independent Engineer

The role and functions of the Independent Engineer shall include the following:

a. Progress Monitoring as required under this Agreement;

b. Ensuring Quality as required under this Agreement;

c. determining, as required under the Agreement, the costs of any works or services and/or their reasonableness during construction phase;

d. determining, as required under the Agreement, the period or any extension thereof, for performing any duty or obligation during construction phase;

e. determining, as required under the Agreement, the valuation of the Project Assets.

f. Assisting the Parties in resolution of Disputes and

g. Undertaking all other duties and functions in accordance with the Agreement.

18.3 Remuneration of Independent Engineer

The fee and charges of the Independent Engineer shall be paid by the Long Term Transmission Customer as per terms & conditions of appointment.

18.4 Termination of appointment

18.4.1 The Long Term Transmission Customer may, in its discretion, terminate the appointment of the Independent Engineer at any time, but only after appointment of another Independent Engineer.

18.4.2 If the TSP has reason to believe that the Independent Engineer is not discharging its duties and functions in a fair, efficient and diligent manner, it

may make a written representation to the Long Term Transmission Customer and seek termination of the appointment of the Independent Engineer. Upon receipt of such representation, the Long Term Transmission Customer shall hold a tripartite meeting with the TSP and Independent Engineer for an amicable resolution, and the decision of Long Term Transmission Customer is final. In the event that the appointment of the Independent Engineer is terminated hereunder, the Long Term Transmission Customer shall appoint forthwith another Independent Engineer.

18.5 Authorised signatories

The Long Term Transmission Customer shall require the Independent Engineer to designate and notify to the Long Term Transmission Customer up to 2 (two) persons employed in its firm to sign for and on behalf of the Independent Engineer, and any communication or document required to be signed by the Independent Engineer shall be valid and effective only if signed by any of the designated persons; provided that the Independent Engineer may, by notice in writing, substitute any of the designated persons by any of its employees.

ARTICLE: 19

19 MISCELLANEOUS PROVISIONS

19.1 Equity Lock-in Commitment:

19.1.1 The aggregate equity share holding of the Selected Bidder in the issued and paid up equity share capital of MP Power Transmission Package-I Limited shall not be less than Fifty one percent (51%) up to a period of one (1) year after COD of the Project.

Provided that, in case the Lead Member or Bidding Company is holding equity through Affiliate/s, Ultimate Parent Company or Parent Company, such restriction as specified above shall apply to such entities.

Provided further, that in case the Selected Bidder is a Bidding Consortium, the Lead Member shall continue to hold equity of at least twenty six percent (26%) upto a period of one (1) year after COD of the Project and any Member of such Bidding Consortium shall be allowed to divest its equity as long as the other remaining Members (which shall always include the Lead Member) hold the minimum equity specified above.

19.1.2 If equity is held by the Affiliates, Parent Company or Ultimate Parent Company of the Selected Bidder, then, subject to the second proviso to Article 19.1.1, such Affiliate, Parent Company or Ultimate Parent Company shall be eligible to transfer its shareholding in MP Power Transmission Package-I Limited to another Affiliate or to the Parent Company / Ultimate Parent Company of the Selected Bidder. If any such shareholding entity, qualifying as an Affiliate / Parent Company / Ultimate Parent Company, is likely to cease to meet the criteria to qualify as an Affiliate / Parent Company / Ultimate Parent Company, the shares held by such entity shall be transferred to another Affiliate / Parent Company / Ultimate Parent Company of the Selected Bidder.

19.1.3 Subject to Article 19.1.1, all transfer(s) of shareholding of MP Power Transmission Package-I Limited by any of the entities referred to in Article 19.1.1 and 19.1.2 above, shall be after prior written intimation to the Long Term Transmission Customer.

19.1.4 For computation of effective Equity holding, the Equity holding of the Selected Bidder or its Ultimate Parent Company in such Affiliate(s) or Parent Company and the equity holding of such Affiliate(s) or Ultimate Parent Company in MP Power Transmission Package-I Limited shall be computed in accordance with the example given below:

If the Parent Company or the Ultimate Parent Company of the Selected Bidder A directly holds thirty percent (30%) of the equity in MP Power Transmission Package-I Limited, then holding of Selected Bidder A in MP Power Transmission Package-I Limited shall be thirty percent (30%);

If Selected Bidder A holds thirty percent (30%) equity of the Affiliate and the Affiliate holds fifty percent (50%) equity in MP Power Transmission Package-I Limited, then, for the purposes of ascertaining the minimum equity/equity lock-in requirements specified above, the effective holding of Bidder A in MP Power Transmission Package-I Limited shall be fifteen percent (15%), (i.e., 30% x 50%)

19.1.5 The provisions as contained in this Article 19.1 shall override the terms of the consortium agreement submitted as part of the Bid.

19.1.6 The TSP shall be responsible to report to Long Term Transmission Customer, within thirty (30) days from the occurrence of any event that would result in any change in its equity holding structure from that which existed as on the date of signing of the Share Purchase Agreement. In such cases, the Long Term Transmission Customer would reserve the right to ascertain the equity holding structure and to call for all such required documents / information / clarifications as may be required.

19.2 Commitment of maintaining Qualification Requirement

19.2.1 The Selected Bidder will be required to continue to maintain compliance with the Qualification Requirements, as stipulated in RFP Document, till the COD of the Project. Where the Technically Evaluated Entity and/or the Financially Evaluated Entity is not the Bidding Company or a Member in a Bidding Consortium, as the case may be, the Bidding Company or Member shall continue to be an Affiliate of the Technically Evaluated Entity and/or Financially Evaluated Entity till the COD of the Project.

19.2.2 Failure to comply with the aforesaid provisions shall be dealt in the same manner as TSP's Event of Default as under Article 13 of this Agreement.

19.3 Language:

19.3.1 All agreements, correspondence and communications between the Parties relating to this Agreement and all other documentation to be prepared and supplied under the Agreement shall be written in English, and the Agreement shall be construed and interpreted in accordance with English language.

19.3.2 If any of the agreements, correspondence, communications or documents are prepared in any language other than English, the English

translation of such agreements, correspondence, communications or documents shall prevail in matters of interpretation.

19.4 Affirmation

The TSP and the Long Term Transmission Customer, each affirm that:

1. neither it nor its respective directors, employees, or agents has paid or undertaken to pay or shall in the future pay any unlawful commission, bribe, pay-off or kick-back; and

2. it has not in any other manner paid any sums, whether in Indian currency or foreign currency and whether in India or abroad to the other Party to procure this Agreement, and the TSP and the Long Term Transmission Customer hereby undertake not to engage in any similar acts during the Term of Agreement.

19.5 Severability

The invalidity or enforceability, for any reason, of any part of this Agreement shall not prejudice or affect the validity or enforceability of the remainder of this Agreement, unless the part held invalid or unenforceable is fundamental to this Agreement.

19.6 Counterparts

This Agreement may be executed in one or more counterparts, each of which shall be deemed an original and all of which collectively shall be deemed one and the same Agreement.

19.7 Breach of Obligations/ Roles

The Parties acknowledge that a breach of any of the obligations/ roles contained herein would result in injuries. The Parties further acknowledge that the amount of the liquidated damages or the method of calculating the liquidated damages specified in this Agreement is a genuine and reasonable pre-estimate of the damages that may be suffered by the non-defaulting Party in each case specified under this Agreement.

19.8 Restriction of Shareholders / Owners Liability

19.8.1 Parties expressly agree and acknowledge that none of the shareholders of the Parties hereto shall be liable to the other Parties for any of the contractual obligations of the concerned Party under this Agreement.

19.8.2 Further, the financial liabilities of the shareholder(s) of each Party to this Agreement shall be restricted to the extent provided in the Indian Companies Act, 1956 / Companies Act, 2013 (as the case may be).

19.9 Taxes and Duties:

19.9.1 The TSP shall bear and promptly pay all statutory taxes, duties, levies and cess, assessed/levied on the TSP, its Contractors or their employees that are required to be paid by the TSP as per the Law in relation to the execution of the Project and for providing Transmission Service as per the terms of this Agreement.

19.9.2 The Long Term Transmission Customer shall be indemnified and held harmless by the TSP against any claims that may be made against the Long Term Transmission Customer in relation to the matters set out in Article 19.9.1.

19.9.3 The Long Term Transmission Customer shall not be liable for any payment of, taxes, duties, levies, cess whatsoever for discharging any obligation of the TSP by the Long Term Transmission Customer on behalf of TSP or its personnel, provided the TSP has consented in writing to the Long Term Transmission Customer for such work, for which consent shall not be unreasonably withheld.

19.10 No Consequential or Indirect Losses

The liability of the TSP shall be limited to that explicitly provided in this Agreement.

Provided that, notwithstanding anything contained in this Agreement, under no event shall the Long Term Transmission Customer or the TSP claim from one another any indirect or consequential losses or damages.

19.11 Discretion:

Except where this Agreement expressly requires a Party to act fairly or reasonably, a Party may exercise any discretion given to it under this Agreement in any way it deems fit.

19.12 Confidentiality

19.12.1 The Parties undertake to hold in confidence this Agreement and RFP Project Documents and not to disclose the terms and conditions of the transaction contemplated hereby to third parties, except:

a) to their professional advisors;

b) to their officers, contractors, employees, agents or representatives,

financiers, who need to have access to such information for the proper performance of their activities; or

c) disclosures required under Law,

without the prior written consent of the other Parties.

Provided that, the TSP agrees and acknowledges that the Long Term Transmission Customer, may, at any time, disclose the terms and conditions of the Agreement and the RFP Project Documents to any person, to the extent stipulated under the Law and the Competitive Bidding Guidelines.

19.13 Order of priority in application:

Save as provided in Article 2.5, in case of inconsistencies between the terms and conditions stipulated in Transmission License issued by the State Commission to the TSP, agreement(s) executed between the Parties, applicable Law including rules and regulations framed thereunder, the order of priority as between them shall be the order in which they are placed below:

- terms and conditions of Transmission License;
- applicable Law, rules and regulations framed thereunder;
- this Agreement.

19.14 Independent Entity:

19.14.1 The TSP shall be an independent entity performing its obligations pursuant to the Agreement.

19.14.2 Subject to the provisions of the Agreement, the TSP shall be solely responsible for the manner in which its obligations under this Agreement are to be performed. All employees and representatives of the TSP or Contractors engaged by the TSP in connection with the performance of the Agreement shall be under the complete control of the TSP and shall not be deemed to be employees, representatives, Contractors of the Long Term Transmission Customer and nothing contained in the Agreement or in any agreement or contract awarded by the TSP shall be construed to create any contractual relationship between any such employees, representatives or Contractors and the Long Term Transmission Customer.

19.15 Amendments:

19.15.1 This Agreement may only be amended or supplemented by a written

agreement between the Parties.

19.16 Waiver:

19.16.1 No waiver by either Party of any default or breach by the other Party in the performance of any of the provisions of this Agreement shall be effective unless in writing duly executed by an authorised representative of such Party.

19.16.2 Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement nor time or other indulgence granted by one Party to the other Parties shall act as a waiver of such breach or acceptance of any variation or the relinquishment of any such right or any other right under this Agreement, which shall remain in full force and effect.

19.17 Relationship of the Parties:

This Agreement shall not be interpreted or construed to create an association, joint venture, or partnership or agency or any such other relationship between the Parties or to impose any partnership obligation or liability upon either Party and neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

19.18 Entirety:

19.18.1 This Agreement along with its sections, schedules and appendices is intended by the Parties as the final expression of their agreement and is intended also as a complete and exclusive statement of the terms of their agreement.

19.18.2 Except as provided in this Agreement, all prior written or oral understandings, offers or other communications of every kind pertaining to this Agreement or the provision of Transmission Service under this Agreement to the Long Term Transmission Customer by the TSP shall stand superseded and abrogated.

19.19 Notices:

19.19.1 All notices or other communications which are required to be given under this Agreement shall be in writing and in the English language

19.19.2 If to the TSP, all notices or communications must be delivered personally or by registered post or facsimile or any other mode duly acknowledged to the addressee below:

Address :

Attention :

Email :

Fax. No. :

Telephone No. :

19.19.3 If to the Long Term Transmission Customer, all notices or communications must be delivered personally or by registered post or facsimile or any other mode duly acknowledged to the addresses below:

(i) …… [Insert Name of the Long Term Transmission Customer]

Address :
Attention
Email :
Fax. No. :
Telephone No. :

19.19.4 All notices or communications given by facsimile shall be confirmed by sending a copy of the same via post office in an envelope properly addressed to the appropriate Party for delivery by registered mail. All notices shall be deemed validly delivered upon receipt evidenced by an acknowledgement of the recipient, unless the Party delivering the notice can prove in case of delivery through the registered post that the recipient refused to acknowledge the receipt of the notice despite efforts of the postal authorities.

19.19.5 Any Party may by notice of at least fifteen (15) days to the other Party change the address and/or addresses to which such notices and communications to it are to be delivered or mailed.

19.20 Fraudulent and Corrupt Practices

19.20.1 The TSP and its respective officers, employees, agents and advisers shall observe the highest standard of ethics during the subsistence of this Agreement. Notwithstanding anything to the contrary contained in the Agreement, the Long Term Transmission Customer may terminate the Agreement without being liable in any manner whatsoever to the TSP, if it determines that the TSP has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice in the Bid process. In such an event, the Long Term Transmission Customer shall forfeit the Contract Performance Guarantee of the TSP, without prejudice to any other right

or remedy that may be available to the Long Term Transmission Customer hereunder or subsistence otherwise.

19.20.2 Without prejudice to the rights of the Long Term Transmission Customer under Clause 19.20.1 hereinabove and the rights and remedies which the Long Term Transmission Customer may have under this Agreement, if a TSP is found by the Long Term Transmission Customer to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice during the Bid process, or after the issue of Letter of Intent (hereinafter referred to as LoI), the Long Term Transmission Customer may terminate the Agreement without being liable in any manner whatsoever to the TSP. Further, the TSP & its Affiliates shall not be eligible to participate in any tender or RFP issued by any BPC for an indefinite period from the date such TSP is found by the Long Term Transmission Customer to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practices, as the case may be.

19.20.3 For the purposes of this Clause 19.20, the following terms shall have the meaning hereinafter respectively assigned to them:

(a) **"corrupt practice"** means (i) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the actions of any person connected with the Bid process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of the BPC who is or has been associated or dealt in any manner, directly or indirectly with the Bid process or the LoI or has dealt with matters concerning the RFP Project Documents or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the BPC, shall be deemed to constitute influencing the actions of a person connected with the Bid Process); or (ii) engaging in any manner whatsoever, whether during the Bid Process or after the issue of the LoI or after the execution of the RFP Project Documents, as the case may be, any person in respect of any matter relating to the Project or the LoI or the RFP Project Documents, who at any time has been or is a legal, financial or technical adviser of the BPC in relation to any matter concerning the Project;

(b)"**fraudulent practice**" means a misrepresentation or omission of facts or suppression of facts or disclosure of incomplete facts, in order to influence the Bid process;

(c) "**coercive practice**" means impairing or harming, or threatening to impair or harm, directly or indirectly, any person or property to influence any person's participation or action in the Bid process;

(d) "**undesirable practice**" means (i) establishing contact with any person connected with or employed or engaged by the BPC with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Bid process; or (ii) having a Conflict of Interest; and

(e) "**restrictive practice**" means forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the Bid process;

19.21 Compliance with Law:

Despite anything contained in this Agreement but without prejudice to Article 12, if any provision of this Agreement shall be in deviation or inconsistent with or repugnant to the provisions contained in the Electricity Act, 2003, or any rules and regulations made there under, such provision shall be deemed to be amended to the extent required to bring it into compliance with the aforesaid relevant provisions as amended from time to time.

IN WITNESS WHEREOF, THE PARTIES HAVE CAUSED THIS AGREEMENT TO BE EXECUTED BY THEIR DULY AUTHORISED REPRESENTATIVES AS OF THE DATE AND PLACE SET FORTH ABOVE.

1. For and on behalf of TSP

……..

[Signature, Name, Designation and Address]

2. For and on behalf of .....[Insert name of the Long Term Transmission Customer]

……..

[Signature, Name, Designation and Address]

WITNESSES:

1. For and on behalf of

   : BPC

……
[Signature]

.....
[Insert, Name, Designation and Address of the Witness]

2. For and on behalf of

   : State Transmission Utility

……
[Signature]

.....
[Insert Name, Designation and Address of the Witness]

SCHEDULES

Schedule: 1

Project Description and Scope of Project

Scope of the Project:

S. No.	Transmission Elements		Completion Target
1	**400/220/132/33kV GIS Substation at Mandideep (District-Raisen)**		24 Months
i	Construction of 400/220/132/33kV GIS substation at Mandideep		
	400kV		
	· ICT (500MVA, 400/220/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2+2 for LILO)	4 Nos.	
	· Bus Reactor (125MVAR)	1 No.	
	· Bus Reactor bay	1 No.	
	· Transfer Bus Coupler / Bus Tie	As required	
	· Space for 400/220kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	4 Nos.	
	220kV		
	· ICT (160MVA, 220/132/33kV)	2 Nos.	
	· ICT bays (2 for 400kV ICT + 2 for 220kV ICT)	4 Nos.	
	· Line bays (2+2 for LILO)	4 Nos.	
	· Transfer Bus Coupler / Bus Tie	As required	
	· Space for 220/132kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future) (2+2)	4 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	132kV		
	· ICT (50MVA, 132/33kV)	1 No.	
	· ICT bays (2 for 220kV ICT + 1 for 132kV ICT)	3 Nos.	
	· Line bays (2+2 for LILO)	4 Nos.	
	· Transfer Bus Coupler / Bus Tie	As required	
	· Space for 132/33kV ICT (Future)	3 Nos.	
	· Space for ICT bays (Future) (2+3)	5 Nos.	
	· Space for Line bays (Future)	8 Nos.	
	33kV		
	· ICT bays	1 No.	
	· Line bays	4 Nos.	
	· Transfer Bus Coupler	As required	
	· HT Shunt Capacitor Bank (12 MVAR)	1 No.	
	· HT Shunt Capacitor Bank bays	1 No.	
	· Station Transformer (500KVA, 33/0.4kV)	2 Nos.	
	· Space for ICT bays (Future)	3 Nos.	
	· Space for Line bays (Future)	12 Nos.	
ii	LILO of both circuit of Itarsi (PGCIL) – Bhopal 400kV line (on Twin Moose) at Mandideep GIS 400kV S/s		

S. No.	Transmission Elements		Completion Target
iii	LILO of both circuit of Hoshangabad – Mandideep - Adampur 220kV line at Mandideep GIS 400kV S/s a. LILO of Hosangabad – Adampur 220kV line at Mandideep GIS 400 kV S/s. b. LILO of Mandideep – Bhopal 220kV line at Mandideep GIS 400 kV S/s.		
iv	LILO of Mandideep – Bhopal 220kV line at Mandideep GIS 400kV S/s		
v	LILO of Mandideep132 – Bagroda 132kV line at Mandideep GIS 400kV S/s		
v	LILO of Mandideep220 – MACT Bhopal 132kV line at Mandideep GIS 400kV S/s		
2	**220/132/33kV substation Bisonikala (District-Hoshangabad)**		
i	Construction of 220/132/33kV substation at Bisonikala		
	220kV		
	· ICT (160MVA, 220/132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2+2 for LILO)	4 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Bus Tie	1 No.	
	· Space for 220/132kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	4 Nos.	
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays (2 for 220kV ICT+2 for 132kV ICT)	4 Nos.	
	· Line bays (2 for LILO+1 for Sodalpur)	3 Nos.	24 Months
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future) (2+2)	4 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	LILO of both circuits of Satpura-Itarsi-Handiya 220kV line at Bisonikala 220kV S/s		

S. No.	Transmission Elements		Completion Target
iii	LILO of SeoniMalwa-Harda 132kV S/c line at Bisonikala 220kV S/s		
3	**220/132/33kV Substation at Khargone (District-Khargone)**		24 Months
i	Construction of 220/132/33kV substation at Khargone		
	220kV		
	· ICT (160MVA, 220/132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2+2 for LILO)	4 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Bus Tie	1 No.	
	· Space for 220/132kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	4 Nos.	
	132kV		
	· ICT (63MVA, 132/33kV)	1 No.	
	· ICT bays (2 for 220V ICT+1 for 132kV ICT)	3 Nos.	
	· Line bays (2+2 for LILO)	4 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	3 Nos.	
	· Space for ICT bays (Future) (2+3)	5 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	1 No.	
	· Line bays	5 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	1 No.	
	· HT Shunt Capacitor Bank bays	1 No.	
	· Station Transformer (200KVA, 33/0.4kV)	2 Nos.	
	· Space for ICT bays (Future)	3 Nos.	
	· Space for Line bays (Future)	12 Nos.	
ii	LILO of both circuits of Chhegaon - Nimrani 220kV line at Khargone 220kV S/s		
iii	LILO of Khargone – Julwaniya (Talakpura) 132kV line at Khargone 220kV S/s		
iv	LILO of Bhikangaon - Bistan 132kV line at Khargone 220kV S/s		
4	**132/33kV substation at Sodalpur (District-Harda)**		18 Months
i	Construction of 132/33kV substation at Sodalpur		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (1 for Bisonikala+1 for Sultanpur)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	

S. No.	Transmission Elements		Completion Target
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	Bisonikala – Sodalpur – Sultanpur 132kV DCSS line.		
5	**132/33kV substation at Jawarjod (District-Sehore)**		
i	Construction of 132/33kV substation at Jawarjod		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for LILO+1 for Ashta)	3 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		18 Months
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	LILO of Ashta - Sonkatch 132kV S/C line at Jawarjod 132kV S/s		
6	**132/33kV substation at Pathari (District-Raisen)**		
i	Construction of 132/33kV substation at Pathari		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for Gairatganj)	2 Nos.	
	· Transfer Bus Coupler	1 No.	18 Months
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	

S. No.	Transmission Elements		Completion Target
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	Gairatganj-Pathari 132kV DCDS line		
7	**132/33kV substation at Badi (District-Raisen)**		
i	Construction of 132/33kV substation at Badi		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (1 for Bareli + 1 for Shahganj)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	18 Months
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	Bareli - Badi - Shahganj 132kV DCSS line		
8	**132/33kV substation at Semrahat (District-Guna)**		
i	Construction of 132/33kV substation at Semrahat		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (1 for Ashoknagar + 1 for Aron)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	18 Months
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	

S. No.	Transmission Elements		Completion Target
	· Space for Line bays (Future)	8 Nos.	
ii	Ashoknagar - Semrahat - Aron 132kV DCSS line		
9	**132/33kV GIS substation at HOD Bhopal (District-Bhopal)**		24 Months
i	Construction of 132/33kV GIS Substation at HOD Bhopal		
	132kV		
	· ICT (63MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for Bhopal220 or Mugaliyachhap)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	4 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	12 Nos.	
ii	Mugaliya Chhap - HOD Bhopal 132kV DCDS line (with Monopole Towers)		
10	**220/33kV substation at Shahpur (District-Betul)**		24 Months
i	Construction of 220/33kV substation at Shahpur		
	220kV		
	· ICT (50MVA, 220/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for LILO)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Bus Tie	1 No.	
	· Space for 220/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	4 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	LILO one circuit of Satpura TPS-Itarsi 220 kV line at Shahpur		

S. No.	Transmission Elements		Completion Target
	220/33kV S/s		
11	**132/33kV substation at Chhapiheda (District-Rajgarh)**		18 Months
i	Construction of 132/33kV substation at Chhapiheda		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (1 for Khujner+1 for Nalkheda)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	Khujner-Chhapiheda-Nalkheda 132kV DCSS line		
12	**132/33kV substation Bhatpachlana (District-Ujjain)**		18 Months
i	Construction of 132/33kV substation at Bhatpachlana		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for LILO + 1 for future Badnagar line)	3 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	LILO of Badnagar-Orange Berchha 132kV DCSS line at Bhatpachlana 132kV S/s (on Multi Circuit tower or separate double circuit towers)		

S. No.	Transmission Elements		Completion Target
13	**132/33kV substation at Dhodhar (District-Ratlam)**		18 Months
i	Construction of 132/33kV substation at Dhodhar		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for LILO)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	LILO of Jaora -Daloda 132kV line at Dhodhar 132kV S/s		
14	**132/33kV substation at Pipalgaon (District-Khargone)**		18 Months
i	Construction of 132/33kV substation at Pipalgaon		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for Kasrawad)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	Kasrawad - Pipalgaon 132kV DCDS line		
15	**132/33kV substation at Ambaja (District-Alirajpur)**		18 Months
i	Construction of 132/33kV substation at Ambaja		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	

S. No.	Transmission Elements		Completion Target
	· Line bays (2 for LILO)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	LILO of Barwani – Kukshi 132kV line at Ambaja 132kV S/s		
16	**132/33kV substation at Choubara Dheera (District-Dewas)**		18 Months
i	Construction of 132/33kV substation at Choubara Dheera		
	132kV		
	· ICT (50MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (1 for Sonkatch + 2 for LILO)	3 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	Sonkatch-ChoubaraDheera 132kV DCSS line		
17	**132/33kV GIS substation at Pithampur Sector-III (District-Dhar)**		24 Months
i	Construction of 132/33kV GIS substation at Pithampur Sector-III		
	132kV		
	· ICT (63MVA, 132/33kV)	2 Nos.	
	· ICT bays	2 Nos.	
	· Line bays (2 for Pithampur)	2 Nos.	
	· Transfer Bus Coupler	1 No.	
	· Space for 132/33kV ICT (Future)	2 Nos.	

S. No.	Transmission Elements		Completion Target
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	6 Nos.	
	33kV		
	· ICT bays	2 Nos.	
	· Line bays	7 Nos.	
	· Transfer Bus Coupler	1 No.	
	· HT Shunt Capacitor Bank (12 MVAR)	2 Nos.	
	· HT Shunt Capacitor Bank bays	2 Nos.	
	· Station Transformer (200KVA, 33/0.4kV)	1 No.	
	· Space for ICT bays (Future)	2 Nos.	
	· Space for Line bays (Future)	8 Nos.	
ii	Pithampur220 - Pithampur Sector-III 132kV DCDS line		
18	**System Strengthening Works**		18 Months
i	Bahadurpur - Badgaon 132kV DCSS line		

Note:

a. TSP shall have to construct the new Substation within the radius of Three (3) kilometers considering the coordinates of the Village (Location) given hereunder as center and intimate the same to MPPTCL:

Sl. No.	Name of Substation	Name of Village/tehsil/district where new S/s is Proposed	New Substation to be constructed within the radius of 3 km from location whose coordinates are given here under	
			Latitude	Longitude
1	400/220/132/33kV GIS substation at Mandideep*	Village - Bhojpur (Mandideep) Tehsil - Goharganj District - Raisen	23° 08'09.23"N	77°36'14.93"E
2	220/132/33kV substation at Bisonikala	Village - BisoniKalan Tehsil - SeoniMalwa District - Hoshangabad	2°28'43.00"N	77°19'49.00"E
3	220/132/33kV substation at Khargone	Village - Khargone Tehsil - Khargone District - Khargone	21°50'24.00"N	75°36'7.00"E
4	132/33kV substation at Sodalpur	Village - Sodalpur Tehsil - Rahatgaon District - Harda	22°19'20.00"N	77°13'16.00"E
5	132/33kV substation at Jawarjod	Village - PipaliyaSalarsi Tehsil - Jawar District - Sehore	22°58'10.00"N	76°31'29.00"E
6	132/33kV substation at Pathari	Village - Pathari Tehsil - Raisen District - Raisen	23°18'37.00"N	78° 1'19.00"E
7	132/33kV substation at Badi	Village - AmrawadKalan Tehsil - Badi	22°57'47.00"N	78° 4'35.00"E

Sl. No.	Name of Substation	Name of Village/tehsil/district where new S/s is Proposed	New Substation to be constructed within the radius of 3 km from location whose coordinates are given here under	
			Latitude	Longitude
		District - Raisen		
8	132/33kV substation at Semrahat	Village - Semrahat Tehsil - Ashoknagar District - Ashoknagar	24°27'60.00"N	77°34'10.00"E
9	132/33kV GIS Substation at HOD Bhopal **(Govt. land shall be allocated)**	Place - Arera Hills, Bhopal City Tehsil - Bhopal District - Bhopal	23°14'5.00"N	77°25'12.00"E
10	220/33kV substation at Shahpur	Village - Shahpur Tehsil - Shahpur District - Betul	22°11'47.00"N	77°54'45.00"E
11	132/33kV substation at Chhapiheda	Village - Chhapiheda Tehsil - Jeerapur District - Rajgarh	23°53'40.00"N	76°27'20.00"E
12	132/33kV substation at Bhatpachlana	Village - Bhatpachlana Tehsil - Badnagar Distt. - Ujjain	23°15'4.00"N	75°17'34.00"E
13	132/33kV substation at Dhodhar	Village - Dhodhar Tehsil - Jaora Distt. - Ratlam	23°46'28.00"N	75° 6'31.00"E
14	132/33kV substation at Pipalgaon	Village - Pipalgaon Tehsil - Kasrawad Distt. - Khargone	22° 6'49.00"N	75°45'21.00"E
15	132/33kV substation at Ambaja	Village - Ambaja Tehsil - Alirajpur Distt. - Alirajpur	22° 6'18.00"N	74°15'18.00"E
16	132/33kV substation at ChoubaraDheera	Village - ChoubaraDheera Tehsil - TonkKhurd Distt. - Dewas	23° 5'55.00"N	76°19'47.00"E
17	132/33kV GIS substation at Pithampur Sector-III **(Govt. land shall be allocated)**	Village - Pithampur Tehsil - Dhar Distt. - Dhar	22°37'20.00"N	75°34'55.00"E

* In case of construction of new 400/220/132kV S/s at Manidideep beyond above boundary limit, concurrence from STU has to be obtained by TSP for selection of S/s land.

b. Bidders may visit the existing Sub-Stations in order to familiarize themselves with the existing system. Based on the request of the bidders, BPC will arrange Sub-Station visit.

c. The requisite number of line bays in MPPTCL substations for termination of associated transmission lines covered under the scope of TBCB shall be provided by MPPTCL at its cost. The matching communication equipment and protection equipment/C&R panels/relays at both ends of the transmission line terminating at MPPTCL's substation, along with its O&M, shall be in the scope of the TSP.

d. For LILO of Badnagar-Orange Berchha 132kV DCSS line at Bhatpachlana 132kV S/s, TSP has to use Multi Circuit towers or separate double circuit towers. Two (02) circuits of multi Circuit tower have to be used for undertaking LILO of Badnagar-Orange Berchha 132kV DCSS line at Bhatpachlana 132kV S/s and on one circuit, TSP has to only lay the 132kV Conductor from the tap point (i.e. from tapping point of LILO of Badnagar-Orange Berchha 132kV DCSS line) to corresponding bay location at proposed Bhatpachlana S/s in the scope of TSP. In future, MPPTCL may extend this line from the tap point to Badnagar / any substation to utilize this circuit.

Project Description

Demand of Madhya Pradesh has reached 14555MW in FY 2019-20 and expected to grow upto 18000MW by year 2022-23. The demand is expected to reach about 21000 MW by the end of 14th Plan.

Accordingly, system studies were carried out to evolve transmission system requirement for the end of 13th Plan period considering load demand of Madhya Pradesh as 18000MW. The studies, inter alia, recommended establishment of 1No. 400/220kV S/s, 5Nos. 220/132kV S/s, 2Nos. 220/33kV S/s and 27Nos. 132/33kV S/s in the MP network. The details of work under Package-I are as follows:

Package-1 : The transmission works under Package-1 are spread in the area of Central Discom and West Discom. These works covers construction of 1No. 400kV GIS S/s, 2 Nos. 220/132kV S/s, 1No. 220/33kV S/s, 11 Nos. 132kV S/s and 2 Nos. 132/33kV GIS S/s. The abstract of transmission works covered under Package-1 is as under:

400/220/132/33kV S/s	1 No. (Mandideep GIS S/s)
220/132/33kV S/s	2 Nos. (Bisonikala, Khargone)
220/33kV S/s	1 No. (Shahpur)
132/33kV S/s	11 Nos. (Sodalpur, Jawarjod, Pathari, Badi, Semrahat, Chhapiheda, Bhatpachlana, Dhodhar, Pipalgaon, Ambaja, Choubara Dheera)
132/33kV GIS S/s	2 Nos. (HOD Bhopal, Pithampur Sector-III)

SPECIFIC TECHNICAL REQUIREMENTS FOR TRANSMISSION LINES

1.0 The Tower shall be fully galvanized using mild steel or/and high tensile steel sections. Bolts and nuts with spring washer are to be used for connection.

2.0 IS Steel section of tested quality in conformity with IS 2062:2011, grade E 250 (Designated Yield Strength 250 Mpa) and/or grade E 350 (Designated Yield Strength 350 MPa) only are permitted to be used in towers, extensions, gantry structures and stub setting templates. The contractor can use other equivalent grade of structural steel angle sections and plates conforming to the latest International standards. However, use of steel grade having designated yield strength more than 350 MPa is not permitted. The steel used for fabrication of towers shall be manufactured by primary steel producers only. For Steel Monopole following materials shall be used:

Pole shaft	: A572-65 or Equivalent
Base plate	: A572-50 or Equivalent
Ladder & Other	: A572-36 or Equivalent
Anchor bolts (220/132kV MC poles)	: 6.8 Grade (132kV poles) and 8.8 Grade
Connection bolts	: 8.8 Grade
Galvanizing	: ASTM A123 (Structure: Avg. coating 85 micron) / A153 (Hardware)

3.0 Towers shall be designed as per IS-802:2015 considering wind zone-4, Reliability Level-2 for Multi Circuit Tower/Monopole and Reliability Level – 1 for Double Circuit & Single Circuit Towers, Terrain category-2. However, drag coefficient of the tower shall be as follows: -

Solidity Ratio	Drag Coefficient
Upto 0.05	3.6
0.1	3.4
0.2	2.9
0.3	2.5
0.4	2.2
0.5 and above	2.0

As per Clause 12.1.2.1 b) 2) of IS 802:2015, Under security condition for tension and dead end towers, the transverse loads due to line deviation shall be the component of 100 percent mechanical tension of conductor and ground wire/ OPGW corresponding to 100% of design wind pressure at everyday temperature or 36% design wind pressure at minimum temperature after accounting for drag coefficient and gust response factor. The above loading shall also be considered for design of suspension tower.

Transmission Service Provider (TSP) shall adopt any additional loading/ design criteria for ensuring reliability of the line, if so desired and/ or deemed necessary in accordance with CEA "Technical Standard for Construction of Electrical Plants and Electric Lines" Regulation 2010, as amended from time to time.

4.0 A) For power line crossing of 400 kV or above voltage level, large angle & dead end towers (i.e. D/DD/QD) shall be used on either side of power line crossing (i.e. D/DD/QD- D/DD/QD arrangement).

B) For overhead crossing of existing power line of 132kV and 220kV voltage level, only (D/DD/QD) angle towers shall be used on either side of power line crossing depending on the merits of the prevailing site condition and line deviation requirement.

C) For power line crossing of 66 kV and below voltage level, suspension/tension towers shall be provided on either side of power line crossing depending upon the merit of the prevailing site condition and line deviation requirement.

D) For crossing of railways, national highways and state highways, the rules/regulations of appropriate authorities shall be followed.

5.0 The conductor configuration shall be as follows: -

5.01: <u>For transmission lines with ACSR/AAAC/AL59 conductor</u>: -

Transmission line	ACSR Conductor specified	Equivalent AAAC conductor based on 53.5% conductivity of Al Alloy	Equivalent AL59 conductor based on 59% conductivity of AL Alloy	Sub-conductor Spacing
400kV D/C (Twin Moose) transmission lines	Moose: Stranding 54/3.53 mm-Al + 7/3.53 mm-Steel, 528.5 sq mm, Aluminium area, 31.77mm diameter	**Stranding Details:** 61/3.55 mm 31.95mm Diameter; 604 sq.mm Aluminum alloy area	**Stranding Details:** 61/3.31 mm 29.79mm Diameter; 525 sq.mm Aluminum alloy area	450 mm
220 kV D/C (Zebra) transmission lines	Zebra: Stranding 54/3.18 mm-Al + 7/3.18 mm-Steel, 428 sq mm, Aluminium area, 28.62 mm diameter	**Stranding Details:** 61/3.19 mm 28.71 mm diameter; 487.5 sq.mm Aluminum alloy area	**Stranding Details:** 61/3.08 mm 27.7 mm diameter; 454 sq.mm Aluminium alloy area	NA
132 kV D/C (Panther) transmission lines	Panther: Stranding 30/3.0 mm-Al + 7/3.0 mm-Steel, 261.5 sq mm, Aluminium area, 21.05 mm diameter	**Stranding Details:**37/3.15 mm 22.05mm Diameter; 288.3 sq.mm Aluminum alloy area	**Stranding Details:** 37/3.08 mm 21.56mm Diameter; 275.66 sq.mm Aluminum alloy area	NA

Note:

i. The transmission lines shall have to be designed for a maximum operating conductor temperature of 85 deg C.

6.0 The required phase to phase spacing and horizontal spacing for 400kV, 220kV, 132kV line shall be governed by the tower design as well as minimum live metal clearances for each voltage level respectively under different insulator swing angles. All electrical clearances including minimum live metal clearance, ground clearance and minimum mid span separation between earth wire and conductor shall be as per Central Electricity Authority (Measures Relating to Safety & Electric Supply) Regulations as amended from time to time and IS: 5613.

For 400 kV transmission lines:

The minimum live metal clearances for 400 kV D/C transmission lines shall be considered as follows:

(i) Under stationary conditions

From tower body: 3.05m

(ii) Under swing conditions

Wind pressure Condition	Minimum electrical clearance
a) Swing angle (22º)	3.05 mtrs
b) Swing angle (44º)	1.86 mtrs

However, the phase to phase spacing for 400 kV D/C Line shall not be less than 8m.

For 220 kV Transmission Lines:

The minimum live metal clearances for 220 kV D/C transmission lines shall be considered as follows:

(i) Under stationary conditions
From tower body: 2.13m

(ii) Under swing conditions

Wind pressure Condition	Minimum electrical clearance
a) Swing angle (15º)	1.98 mtrs
b) Swing angle (30º)	1.83 mtrs
c) Swing angle (45º)	1.675 mtrs

However, the phase to phase spacing for 220 kV D/C Line shall not be less than 5m.

For 132 kV Transmission Lines:

The minimum live metal clearances for 132 kV D/C transmission lines shall be considered as follows:

(i) Under stationary conditions
From tower body: 1.53 m

(ii) Under swing conditions

Wind pressure Condition	Minimum electrical clearance
a) Swing angle (15º)	1.53 mtrs
b) Swing angle (30º)	1.37mtrs
c) Swing angle (45º)	1.22 mtrs
d) Swing angle (60º)	1.07 mtrs

However, the phase to phase spacing for 132 kV D/C Line shall not be less than 4m.

7.0 The minimum ground clearance for 400kV D/C transmission lines shall be 8.84m, for 220 kV D/C line shall be 7.015 m and for 132 kV D/C line shall be 6.10 m so that maximum electric field does not exceed 10kV/m within the ROW and does not exceed 5kV/m at the edge of the ROW as per international guidelines.

8.0 The minimum mid span separation between earthwire and conductor shall be 9.0 m for 400 kV D/C transmission lines, 8.5 m for 220 kV D/C transmission lines & 6.1 m for 132 kV D/C transmission lines. Shielding angle shall not exceed 20 deg for 400 kV D/C & 30 deg for 220 kV D/C lines and 132 kV D/C lines.

9.0 Transposition is to be done for all transmission lines whose length is greater than 100km. Transposition should be carried out at 1/3 and 2/3 of line length tower positions.

10.0 The switching impulse withstand voltage (wet) for 400kV line shall be 1050 kVp. Lightning impulse withstand voltage (dry) for 400kV line shall be 1550 kVp, for 220 kV line shall be 1050 kVp & for 132kV line shall be 650 kVp.

11.0 The Fault current for design of line shall be 63 kA for 1 sec for 400 kV, 50 kA for 1 sec for 220 kV and 40 kA for 1 sec for 132 kV.

12.0 Porcelain / glass / polymer insulators shall be used in the line as per requirement and site conditions However, porcelain /glass disc insulators string shall be required to be used for Pilot string irrespective of type of insulators used for suspension/tension location.

13.0 Each tower shall be earthed such that tower footing resistance does not exceed 10 ohms. Pipe type or Counterpoise type earthing shall be provided in accordance with relevant IS. Additional earthing shall be provided on every 7 to 8 kms distance at tension tower for direct earthing of both shield wires. If site condition demands, multiple earthing or use of earthing enhancement compound shall be used. The line surge arrester, if required , may be used in lightning prone areas.

14.0 The factors of safety for design of towers/Monopoles and extensions shall be as under:-

Normal condition - 1.1
Broken wire condition- 1.1

15.0 The minimum factors of safety/overload factor based on the ultimate strength of the foundation material when the towers are under full Ultimate loads under various conditions of loadings combined with the other loads specified for the foundations shall be as given below:-

Normal condition- 1.2
Broken wire condition- 1.2

The above factor of safety will be considered on design loads of tower without factor of safety (1.1).

16.0 Pile type foundation shall be used for towers located in river or creek bed or on bank of river having scourable strata or in areas where river flow or change in river course is anticipated, based on detailed soil investigation and previous years' maximum flood discharge of the river, maximum velocity of water, highest flood level, scour depth & anticipated change in course of river based on river morphology data of at least past 20 years to ensure availability and reliability of the transmission line..

17.0 In case of 400kV voltage class lines, at least one out of two earth wires shall be OPGW and second earth wire, if not OPGW, shall be either of galvanized standard steel (GSS) or AACSR or any other suitable conductor type depending upon span length and other technical consideration.

18.0 Transmission line route shall be finalized, in consultation with appropriate authorities so as to avoid the habitant zones of endangered species and other protected species. Bird diverters, wherever required, shall be provided on the line.

19.0 The raised chimney foundation is to be provided in areas prone to flooding/water stagnation like paddy field /agricultural field & undulated areas to avoid direct contact of water with steel part of tower. The top of the chimney of foundation should be at least above HFL (High Flood Level) or the historical water stagnation/ logging level (based on locally available data) or above High Tide Level or 500 mm above Natural Ground level (whichever is higher).

20.0 For transmission line sections passing within a distance of 50 km from the boundary of the two wind zones, higher of the two wind zones shall be considered for design of towers located in such sections.

SPECIFIC TECHNICAL REQUIREMENTS FOR SUBSTATION

The proposed new substation shall be generally conforming to the requirement of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2010, as amended from time to time.

2.1 Salient features of 400/220/132KV Sub Station Equipment and Facilities

The design and specification of substation equipment are to be governed by the following factors:

2.2 Insulation Coordination

420kV System would be designed to limit the Switching over voltage to 2.5 p.u and is expected to decay to 1.5 p.u. in 5 to 6 cycles. Consistent with these values and protective levels provided by lightning arrestors, the following insulation levels shall be adopted for 420kV, 245kV, 145 kV and 36 kV systems:

SL No	Description of parameters	400kV System	220kV System	132kV System	33kV System
1.	System operating voltage (rms)	400kV	220kV	132kV	33kV
2.	Maximum voltage of the system (rms)	420kV	245kV	145kV	36kV
3.	Rated frequency	50Hz	50Hz	50Hz	50Hz
4.	No. of phases	3	3	3	3
5.	Impulse withstand voltage for Transformer and reactors for other Equipment for insulator strings	 1300 kVP 1425 kVP 1550 kVP	 950 kVP 1050 kVP 1050 kVP	 650 kVP 650 kVP 650 kVP	 250kVP 170kVP
6.	Switching surge withstand voltage	1050 kVP	-NA-	-NA-	-NA-
7.	Minimum creepage distance for insulator strings for other Equipment	 13020 mm 10500 mm	 7595 mm 6125 mm	 4495 mm 3625 mm	 900 mm 900 mm
8.	Max. fault current	63 kA	50 KA	40 KA	31.5 KA
9.	Duration of fault	1 Sec	1 Sec	1 Sec	3 Sec
10.	Corona extinction voltage	320kV rms	156kV rms	105kV rms	NA

2.3 Switching Schemes

It is essential that the system should remain secured even under conditions of major equipment or bus-bar failure. Sub-stations being the main connection points have large influence on the security of the system as a whole. The selection of the bus switching scheme is governed by the various technical and other related factors. One & Half breaker bus scheme for 400kV system, Double Main and Transfer bus scheme for the 220kV system, and Single Main and Transfer bus scheme for the 132kV system have been considered for all proposed AIS substations under present scope of work & One & Half breaker bus scheme for 400kV system, Double Main for the 220kV system, and 132kV system have been considered for all proposed GIS substations under present scope of work due to their merits in terms of reliability, security, operational flexibility and ease of maintenance of equipment's. 132kV and 33kV switching system (bus) is required to include section isolators at suitable locations for sectionalization of bus. In 400kV substations, each circuit of a double circuit transmission line shall be terminated in different diameter. Similarly, 400kV ICTs shall also be terminated in different diameter. Accordingly, following switching schemes shall be adopted.

Voltage / Type of Substation	400kV side	220kV side	132kV side	33kV side
AIS Type	One & half breaker	Double Main & Transfer (DMT)	Single Main & Transfer (SMT)	Single Main & Transfer (SMT)
GIS Type	One & half breaker	Double Main	Double Main	Double Main

Note: All the proposed substations under present scope shall be AIS type except for proposed substations at Mandideep (District – Raisen), HOD Bhopal (District – Bhopal) and Pithampur Sector-III (District - Dhar) which shall be GIS Type.

2.4 Substation Equipment and facilities:

The switch-gear shall be designed to withstand operating conditions and duty requirements. The equipment shall be designed considering the transmission line capacity.

Sl. No	Description of Bay	400kV	220kV	132kV	33kV
1	Bus Bar	4000A	3000A	3000A	1600A
2	Line bays	3150A	1600A	1250A	400A
3	ICT bays	3150A	1600A (for	1250A	1200A

			400/220kV) & 800A (for 220/132kV)		
4	Bus Reactor bays	2000A	NA	NA	NA
5	Bus coupler bays	NA/4000 A	2500A	NA	NA

400/220/132/33KV GIS Substation equipment

GIS (Gas Insulated Switchgear) shall be indoor type and in accordance to IEC: 62271-203. The switchgear shall be designed and specified to withstand operating conditions and duty requirements. All the switchgear such as Circuit Breaker, isolator, earth switch including CT, PT etc. shall be GIS type. The Surge Arrestors and Voltage transformer connections shall be either GIS or Outdoor AIS type. 400kV scheme shall be designed in such a way that it shall be possible to use line reactors (if provided) as bus reactors, in case of outage of line, to control bus voltage. Local control cabinets (LCC) shall be provided as per requirement. The alarm & annunciation of GIS equipment shall be wired to SCADA System.

The GIS assembly shall consist of separate modular compartments e.g. Circuit Breaker compartment, Bus bar compartment filled with SF6 Gas and separated by gas tight partitions so as to minimize risk to human life, allow ease of maintenance and limit the effects of gas leaks failures & internal arcs etc. These compartments shall be such that maintenance on one feeder may be performed without de-energizing the adjacent feeders. These compartments shall be designed to minimize the risk of damage to adjacent sections and protection of personnel in the event of a failure occurring within the compartments. Rupture diaphragms with suitable deflectors shall be provided to prevent uncontrolled bursting pressures developing within the enclosures under worst operating conditions, thus providing controlled pressure relief in the affected compartment. The arrangement of gas sections or compartments shall be such as to facilitate future extension of any make without any drilling, cutting or welding on the existing equipment. To add equipment, it shall not be necessary to move or dislocate the existing switchgear bays. The layout of the Gas Insulated Bus Ducts shall be properly planned to optimize the length of bus ducts and for easy accessibility for maintenance. The length of the busbars, bus ducts, and isolator sections shall be optimized considering effects of fast transient voltage due to isolator operations.

The bus bar modules including auxiliary bus modules (wherever applicable) shall be provided with suitable End Piece (Interface) module with the test link facility for future extension as per provisions of future requirement. The end piece module shall be designed in such a way so that future GIS module can be tested without extending test voltage to existing bus and vice-versa by removing the test link.

As the GIS is likely to be extended in future the TSP shall make available the complete details for the design of interface module such as cross section, enclosure material, enclosure dimensions (inner & outer), Flange diameter (inner & outer), conductor cross-section & connection arrangement, bolt spacing & dimension, rated gas pressure, Gasket detail etc. Further, adequate space for GIS Bus bar Interface module shall be taken into account for future scope.

The material and thickness of the enclosures shall be such as to withstand an internal flash over without burns through for a period of 300 milliseconds at rated short time withstand current. The material shall be such that it has no effect of environment as well as from the by-products of SF6 breakdown under arcing condition. This shall be validated with Type Test.

Each section shall have plug- in or easily removable connection pieces to allow for easy replacement of any component with the minimum of disturbance to the remainder of the equipment. Inspection windows (View Ports) shall be provided for Disconnector Switches and both type of earth switches i.e. Maintenance and fast operating.

Local control cabinets (LCC) shall be provided as per requirement. The alarm & annunciation of GIS equipment shall be wired to SCADA System.

Service continuity requirement for GIS:

The GIS equipment with the given bus switching arrangement is divided into different gas compartments. During the work such as a fault repair or major maintenance, requiring the dismantling of a gas compartment for which more than one compartments may need to be de-gassed.

During the above, following Service continuity conditions shall be ensured by TSP to the extent possible:

- For One & half breaker bus switching scheme during a fault in CB compartment, no bus bar and feeder is permitted out of service during maintenance and repair/replacement.
- For Double Main bus switching scheme during a fault in CB compartment, no bus bar permitted out of service during maintenance and repair/replacement.
- During a fault in GIS compartment other than Circuit Breaker compartment, maximum one bus bar and/or one feeder permitted out of service during maintenance and repair/replacement.

UHF sensors in GIS for PD (Partial Discharge) detection: Online partial discharge monitoring system:

The PDM system shall be provided with all its hardware and software, with readily interfacing to the UHF PP coupler installed in the GIS substation.

Adequate number of UHF sensors shall be provided in the offered GIS along with suitable PD measuring instrument for detection of Partial discharge (of 5 pC and above) as per IEC 60270. The number and location of these sensors shall be based on laboratory test on typical design of GIS as per recommendations of CIGRE Document No. 654 *(APPLICATION GUIDE FOR SENSITIVITY VERIFICATION for UHF PARTIAL DISCHARGE DETECTION SYSTEM FOR GIS).*

2.5 GIS Circuit Breakers

GIS Circuit breakers shall in general be of C2-M2 class and comply to IEC-62271-100 & IEC62271-1. The rated break time shall not exceed 40 milliseconds for 420KV and 60 milliseconds for 245kV. 420 kV & 245 kV Circuit breakers shall be provided with single phase and three phase auto reclosing. The Circuit breakers controlling 400 KV lines wherever required shall be provided with pre insertion closing resistor of about 400 ohms with 8 miliseconds insertion time or Controlled Switching Device (CSD) for lines longer than 200 kilometers. The short line fault capacity shall be same as the rated capacity and this is proposed to be achieved without use of opening resistors. Control switching device shall be provided in Circuit breaker of switchable line reactor bay and in Main & Tie bay circuit breakers of line with non-switchable line reactors and Bus reactors. Further, it shall be possible to use line reactors as bus reactors, in case of outage of line.

2.6 GIS Isolators

The isolators shall comply to IEC 62271-102 in general. Earth switches are provided at various locations to facilitate maintenance. Main blades and earth blades shall be interlocked and interlock shall be fail safe type. All isolators and earth switches shall be motor operated type.

Isolator shall be of extended mechanical endurance class - M2 and suitable for Bus Transfer Current Switching duty as per IEC standard. High speed earthing switches shall be provided for grounding purpose at overhead line terminations & cable terminations and shall have fault making capability, as specified. Earth switch for line isolator shall be of earthing switch class E1 and shall be suitable for induced current switching duty as defined for Class B as per relevant standard.

2.7 Maintenance Grounding Switches:

Grounding switches shall comply latest version of the relevant specification IEC 60129, 61128, 61129, 61259. Disconnector switches & Grounding switches shall have electrical & Mechanical interlock to prevent grounding switch from closing on an energized section.

2.8 GIS Current Transformers

Current Transformers shall comply with IEC 61869 in general. All ratios shall be obtained by secondary taps only. Generally, Current Transformers (CT) shall have six cores (four cores for PX class for protection and two cores of 0.2S class accuracy for metering) and, CT in Tie bays shall have six cores (four cores for PX class for protections & two cores of 0.2S class accuracy for metering) suitably distributed on both sides of CB. The burden and knee point voltage shall be in accordance with the requirements of the system including possible feeds for telemetry.

The rated burden of cores shall be closer to the maximum burden requirement of metering & protection system (not more than 20VA for metering core) for better sensitivity and accuracy. Rating for 400kV CT shall be 3000-2000-500/1-1-1-1-1-1 and for 220kV CT it shall be 1600-800/1-1-1-1-1-1. The current transformer shall be provided on both side of circuit breaker so that the fault location can be easily identified. The instrument security factor shall be less than 5.

2.9 GIS Voltage Transformer

The voltage transformers shall conform to IEC- 61869. Voltage transformers shall be of the electromagnetic type with SF6 gas insulation. The earth end of the high voltage winding and the ends of the secondary winding shall be brought out in the terminal box. The voltage transformers shall be located as a separate bay module and will be connected phase to ground and shall be used for protection, metering and synchronization. The voltage transformers shall be of inductive type, nonresistant and shall be contained in their own-SF6 compartment, separated from other parts of installation. The voltage transformers shall be effectively shielded against high frequency electromagnetic transients. The voltage transformers shall have three secondary windings. The voltage transformer should be thermally and dielectrically safe when the secondary terminals are loaded with the guaranteed thermal burdens. The accuracy class for core –I & II for 400 kV shall be 0.2/3P and for 220 kV shall be 3P. The accuracy of 0.2 on secondary III should be maintained throughout the entire burden range up to 100 VA on all the three windings without any adjustments during operation.

The rated burden of cores shall be closer to the maximum burden requirement of metering & protection system (not more than 100 VA for metering core) for better sensitivity and accuracy.

2.10 SF6 to Air Bushing

Outdoor bushings, for the connection of conventional external conductors to the SF6 metal enclosed switchgear, shall be provided. Bushings shall generally be in accordance with the requirements of IEC-60137. The creepage distance over the external surface of outdoor bushings shall not be less than 31 mm/kV and in highly polluted area it shall not be less than 31mm/kV. SF6 to air Bushing shall be of Polymer / composite type and shall be robust and designed for adequate cantilever strength to meet the requirement of seismic condition. The electrical and mechanical characteristics of bushings shall be in accordance with IEC: 60137. Polymer / composite insulator shall be seamless sheath of a silicone rubber compound. The housing & weather sheds should have silicon content of minimum 30% by weight. It should protect the bushing against environmental influences, external pollution and humidity. The hollow silicone composite insulators shall comply with the requirements of the IEC publications IEC 61462 and the relevant parts of IEC 62217.The design of composite insulator shall be tested and verified according to IEC 61462.

2.11 Power Transformer

500MVA, 400/220/33 kV 3-Phase Auto Transformer shall conform to CEA's "Standard Specifications and Technical Parameters for Transformers and Reactors (66 kV and above)" available on CEA website.

Further, the major technical particulars/parameters of **160MVA, 220/132/33, 50MVA, 220/33 kV, 63MVA, 132/33 kV and 50MVA, 132/33 kV** are given below and shall be read in conjunction with CEA's "Standard Specifications and Technical Parameters for Transformers and Reactors (66 kV and above)" available on CEA website

A. 160MVA, 220/132/33 kV, 3-Phase Auto Transformer

Sl. No.	Description	Unit	Technical Parameters
1.	Rated Capacity: HV/IV/LV (tertiary: Active Loading)	MVA	160/160/53.33
2.	Voltage ratio (Line to Line)	kV	220/132/33
3.	Vector Group (unless specified differently elsewhere)		YNaOd11
4.	Cooling		ONAN/ONAF ONAN/ONAF1/ONAF2
5.	Rating at different cooling	%	60/80/100
6.	Type of Transformer		Constant Ohmic impedance type
7.	Impedance at 75° C		
a.	HV-IV		
	Maximum Voltage Tap	%	7.5
	Principal Tap	%	8.35
	Minimum Voltage Tap	%	10.5
b.	HV-LV		
	Principal Tap	%	30
c.	IV-LV		
	Principal Tap	%	20
8.	Max. Temperature rise over 50° C ambient Temp	°. C	Top oil: 45ºC& Winding: 50ºC
9.	Windings		
i).	Insulation Level (LI/SI/PF)		kVp/kVp/kVrms
a)	HV		950/750/395
b)	IV		650/-/230
c)	LV		250/-/95
d)	Neutral		250/-/95
ii)	Tan delta of winding	%	< 0.45 @ 20° C
10.	Tap Changer & Tappings		OLTC with ±10% of HV variation in the step of 1.25%, 16 steps, on 132kV side of series winding (Bidirectional flow of power linear type)
11.	Maximum Partial discharge (PD) level at 1.58*Ur/√3	pC	<100

Sl. No.	Description	Unit	Technical Parameters
12.	Noise level at rated voltage and at principal tap at no load and all cooling active	dB	< 75
13.	Bushing		
i)	Rated voltage	kV	245/145/72.5/72.5
ii)	Rated current(Min.) HV/IV/LV/Neutral	A	1250/1250/1250/1250
iii)	Insulation Level (LI/SI/PF)		kVp/kVp/kVrms
a)	HV		1050/850/505
b)	IV		650/-/305
c)	LV		325/-/140
d)	Neutral		325/-/140
iv)	Insulation Level of 33kV equipment to be installed on	kV	72.5
v)	Tan delta of bushings HV/LV (at ambient	%	< 0.4
vi)	Max. PD of bushings at level Um (Um=245kV)	pC	<10
14.	Insulating Oil		Unused inhibited or uninhibited transformer oil, conforming to IEC-60296-2012/ IS:335
15.	Losses		
a)	Maximum No-Load Loss at rated voltage and frequency	kW	30
b)	Maximum Load Loss at rated current and 75ºC	kW	180
c)	Maximum Auxiliary Loss at rated voltage and frequency	kW	

B. 50MVA, 220/33 kV, 3-Phase Transformer (Two Winding Transformer)

Sl. No.	Description	Unit	Technical Parameters
1.	Rated Capacity: HV/LV	MVA	50
2.	Voltage ratio (Line to Line)	kV	220/33
3.	Vector Group(unless specified differently elsewhere)		YNyn0
4.	Cooling		ONAN/ONAF
5.	Rating at different cooling above	%	80/100
6.	Type of Transformer		CFVV
7.	Impedance at 75° C		
a)	HV – LV (with tolerance as per	%	10

Sl. No.	Description	Unit	Technical Parameters
	IEC)		
8.	Max. Temperature rise over 50° C ambient Temp	°. C	Top oil: 45& Winding: 50
9.	Windings		
i).	Insulation Level (LI/PF)		kVp/kVrms
a)	HV		950/395
b)	LV		250/95
c)	Neutral		250/95
ii)	Tan delta of winding	%	< 0.45 @ 20° C
10.	Tap Changer &Tappings		OLTC with range -15% to +5% of HV variation in the step of 1.25%, 16 steps, on 132kV side of series winding (170kV, 500Amp.)
11.	Maximum Partial discharge (PD) level at 1.58*Ur/√3	pC	<100
12.	Noise level at rated voltage and at principal tap at no load and all cooling active	dB	<75
13.	Bushing		
i)	Rated voltage (HV/LV/Neutral)	kV	245/72.5/72.5
ii)	Rated current(Min.) HV/LV/Neutral	A	1250/1250/1250
iii)	Insulation Level (LI/PF)		kVp/kVrms
a)	HV		1050/460
b)	LV		325/140
c)	Neutral		325/140
iv)	Tan delta of bushings HV/LV (at ambient temperature)	%	< 0.4
v)	Max. PD of bushings at level Um (Um=245kV)	pC	<10
14.	Insulating Oil		Unused inhibited or uninhibited transformer oil, conforming to IEC-60296:2012/ IS:335
15.	Losses		
a)	Maximum No-Load Loss at rated voltage and frequency	kW	27
b)	Maximum Load Loss + Auxiliary Loss at rated current and 750C	kW	150

C. 63MVA, 132/33 kV, 3-Phase Transformer (Two Winding Transformer)

Sl. No.	Description	Unit	Technical Parameters
1.	Rated Capacity: HV/LV	MVA	63
2.	Voltage ratio (Line to Line)	kV	132/33
3.	Vector Group (unless specified differently elsewhere)		YNyn0
4.	Cooling		ONAN/ONAF
5.	Rating at different cooling above	%	80/100
6.	Type of Transformer		Constant Flux
7.	Impedance at 75° C		
a)	HV – LV (with tolerance as per IEC)	%	10
8.	Max. Temperature rise over 50° C ambient Temp	Deg. C	Top oil: 45 & Winding: 50
9.	Windings		
i).	Insulation Level (LI/PF)		kVp/kVrms
a)	HV		550/230
b)	LV		250/95
c)	Neutral		250/95
ii)	Tan delta of winding	%	<0.45%
10.	Tap Changer & Tappings		OLTC with range -15% to +5% of HV variation in the step of 1.25%, 16 steps, on 132kV side of winding (66kV/132kV suitable for neutral end) 500Amp.
11.	Maximum Partial discharge (PD) level at 1.58*Ur/√3	pC	<100
12.	Noise level at rated voltage and at principal tap at no load and all cooling active	dB	< 75
13.	Bushing		
i)	Rated voltage (HV/LV/Neutral)	kV	145/72.5/72.5
ii)	Rated current(Min.) HV/LV/Neutral	A	1250/2000
iii)	Insulation Level (LI/PF)		kVp/kVrms
a)	HV		650/275
b)	LV		325/140
c)	Neutral		325/140
iv)	Tan delta of bushings HV/LV (at ambient temperature)	%	< 0.4

Sl. No.	Description	Unit	Technical Parameters
v)	Max. PD of bushings at level Um (Um=245kV)	pC	<10
14.	Insulating Oil		Unused inhibited or uninhibited transformer oil, conforming to IEC-60296-2012/ IS:335
15.	Losses		
a)	Maximum No-Load Loss at rated voltage and frequency	kW	25
b)	Maximum Load Loss + Auxiliary Loss at rated current and 75°. C	kW	145

D. 50MVA, 132/33 kV, 3-Phase Transformer (Two Winding Transformer)

Sl. No.	Description	Unit	Technical Parameters
1.	Rated Capacity: HV/LV	MVA	50
2.	Voltage ratio (Line to Line)	kV	132/33
3.	Vector Group(unless specified differently elsewhere)		YNyn0
4.	Cooling		ONAN/ONAF
5.	Rating at different cooling above	%	80/100
6.	Type of Transformer		Constant Flux
7.	Impedance at 75° C		
a)	HV – LV (with tolerance as per IEC)	%	10
8.	Max. Temperature rise over 50° C ambient Temp	Deg. C	Top oil: 45& Winding: 50
9.	Windings		
i).	Insulation Level (LI/PF)		kVp/kVrms
a)	HV		550/230
b)	LV		250/95
c)	Neutral		250/95
ii)	Tan delta of winding	%	0.45 @20ºC
10.	Tap Changer &Tappings		OLTC with range -15% to +5% of HV variation in the step of 1.25%, 16 steps, on 132kV side of winding

Sl. No.	Description	Unit	Technical Parameters
11.	Maximum Partial discharge (PD) level at 1.58*Ur/√3	pC	<100
12.	Noise level at rated voltage and at principal tap at no load and all cooling active	dB	< 75
13.	Bushing		
i)	Rated voltage (HV/LV/Neutral)	kV	145/72.5/72.5
ii)	Rated current(Min.) HV/LV/Neutral	A	1250/2000
iii)	Insulation Level (LI/PF)		kVp/kVrms
a)	HV		650/275
b)	LV		325/140
c)	Neutral		325/140
iv)	Tan delta of bushings HV/LV (at ambient temperature)	%	< 0.4
v)	Max. PD of bushings at level Um (Um=245kV)	pC	<10
14.	Insulating Oil		Unused inhibited or uninhibited transformer oil, conforming to IEC-60296-2012/ IS:335
15.	Losses		
a)	Maximum No-Load Loss at rated voltage and frequency	kW	25
b)	Maximum Load Loss + Auxiliary Loss at rated current and 75°. C	kW	125

2.12 Shunt Reactors

125 MVAR, 420 KV, 3-Phase Reactor shall conform to CEA's "Standard Specifications and Technical Parameters for Transformers and Reactors (66 kV and above)" available on CEA website.

A. Controlled Switching Device at Bus & Line Reactor

The controlling relay shall record and monitor the switching operations and make adjustments to the switching instants to optimize the switching behavior as necessary. It shall provide self-diagnostic facilities, signaling of alarms and enable downloading of data captured from the switching events.

The controller shall be designed to operate at the correctly and satisfactorily with the excursion of auxiliary A/C & DC voltages and frequency as specified in section – GTR which are stated below:

Normal Voltage	Variation in Voltage	Frequency in Hz	Phase/Wire	Neutral Connection
415V	±10%	50±5%	3/4 Wire	Solidly Earthed
240V	±10%	50±5%	1/2 Wire	Solidly Earthed
220V	190V to 240V	DC	-	Isolated 2 wire system
240V	95V to 120V	DC	-	Isolated 2 wire system
50V	-	DC	-	2 wire system(+) Earthed

The controller shall meet the requirements of IEC-60255-4 Appendix ‘E’ class III regarding HF disturbance test, and fast transient test shall be as per IEC-61000 – 4 level III and insulation test as per 60255 – 5.

2.13 SF6 Circuit Breakers (AIS)

The circuit breakers and accessories shall conform to IEC: 62271-100, IEC: 62271-01 and shall be of SF6 Type. The circuit breakers shall be class C2-M2 (as per IEC) with regard to restrike probability during capacitive current breaking and mechanical endurance. The rated break time shall not exceed 40 ms for 400kV circuit breakers and 60 ms for 220kV & 132kV circuit breakers. 400kV and 220kV Circuit breakers shall be provided with single phase and three phase auto reclosing. The Circuit breakers controlling 400kV lines wherever required shall be provided with pre insertion closing resistor of about 450 ohms maximum with 8 milliseconds minimum insertion time for lines longer than 200km. The short line fault capacity shall be same as the rated capacity and this is proposed to be achieved without use of opening resistors. 400kV Circuit Breaker shall be equipped with controlled switching device for controlling of transformer and shunt reactor. The controlled switching device shall be provided in 400kV Circuit breakers of switchable line reactor and in Main & Tie bay circuit breakers of line with non-switchable line reactors and Bus reactors.

The Technical Particulars / Parameters of Circuit Breakers:

Sl. No.	Parameter	400kV system	220kV system	132kV system	33kV system
1.	Rated voltage (Umax) kV (rms)	420	245	145	36
2.	Rated frequency (Hz)	50	50	50	50
3.	No. of poles	3	3	3	3
4.	Type of circuit breaker	SF6 gas insulated	SF6 gas insulated	SF6 gas insulated	Vacuum
5.	Rated continuous current (A) at an ambient temperature of 50°. C	3150	3150	2000	1250
6.	Rated short circuit capacity with percentage of DC component as per IEC-62271-100 corresponding to minimum opening time under operating conditions specified.	63kA	50 kA	40kA	31.5kA
7.	Symmetrical interrupting capability (rms)	63kA	50 kA	40kA	25kA
8.	Rated short circuit making current	157.5 kAp	125 kAp	100 kAp	62.5 kAp
9.	Short time current carrying capability (rms)	63 for one second	50 for one second	40 for one second	31.5 For three second
10.	Out of phase breaking current carrying capability (rms)	15.75	As per IEC	As per IEC	As per IEC
11.	Rated line charging interrupting current at 90°. Leading power factor angle (rms) (The breaker shall be able to interrupt the rated line charging current with test voltage immediately before opening equal to the	600 A	As per IEC	As per IEC	As per IEC

Sl. No.	Parameter	400kV system	220kV system	132kV system	33kV system
	product of U/√3 and 1.4 as per IEC-62271-100				
12.	First pole to clear factor	1.3	1.3	1.3	1.5
13.	Temperature rise over an ambient temperature of 50°.C	As per IEC: 62271-100	As per IEC: 62271-100	As per IEC: 62271-100	As per IEC: 62271-100
14.	Rated break time as IEC (with limiting auxiliary voltage at all duties)	40 ms	60 ms	60 ms	NA
15.	Total break time	40ms	50ms	60ms	40±15ms
16.	Total closing time	Not more than 110ms	Not more than 100ms	Not more than 100ms	60±15ms
17.	Operating mechanism or a combination of these	Spring	Spring	Spring	Spring
18.	Rated operating duty cycle	O-0.3s-CO-3 min-CO	O-0.3s-CO-3 min-CO	O-0.3s-CO-3 min-CO	O-0.3s-CO-3 min-CO
19.	Reclosing	Single phase &Three phase auto reclosing.	Single phase &Three phase auto reclosing.	Three phase auto reclosing.	3 Pole Reclosing
20.	Pre-insertion resistor requirement				
i)	Rating (ohms)	400(max.) with tolerance as applicable	NA	NA	NA

Sl. No.	Parameter	400kV system	220kV system	132kV system	33kV system
ii)	Minimum electrical (mechanical insertion time +pre-arcing time) pre-insertion time (ms)	8	NA	NA	NA
iii)	Opening of PIR contacts	PIR contacts should open immediately after closing of main contacts OR At least 5 ms prior to opening of main contacts at rated air/gas pressure where the PIR contacts remain closed	NA	NA	NA
21.	Max. difference in the instants of closing/opening of contacts (ms) between poles at rated control voltage and rated operating & quenching media pressures	2.5 (within a pole) 3.3 (opening) 5.0 (closing)	3.3 (opening) 5.0 (closing)	3.3 (opening) 3.3 (closing)	NA
22.	Maximum allowable switching over voltage under any switching condition	2.3 p.u.	As per IEC	As per IEC	As per IEC
23.	Trip coil and closing coil voltage with variation as specified	220V DC	220V DC	220V DC	
24.	Noise level at base and up to 50 m	140dB (max.)	140dB (max.)	140dB (max.)	140dB (max.)

Sl. No.	Parameter	400kV system	220kV system	132kV system	33kV system
	distance from base of circuit breaker				
25.	Rating of Auxiliary contacts	10A	10A	10A	
26.	Breaking capacity of Aux. Contacts	10A DC with circuit time constant not less than 20ms	10A DC with circuit time constant not less than 20ms	10A DC with circuit time constant not less than 20ms	10A DC with circuit time constant not less than 20ms
27.	Rated insulation levels				
i)	Full wave impulse withstand (1.2 /50 µs) between line terminals and ground	±1425 kVp	±1050 kVp	±650 kVp	±170 kVp
ii)	Full wave impulse withstand (1.2 /50 µs) between terminals with circuit breaker open	1425 kVp impulse on one terminal & 240 kVp power frequency voltage of opposite polarity on the other terminal	±1050 kVp	+ 650kVp	±170 kVp
iii)	Rated switching impulse withstand voltage (250/2500 µs) Dry & wet between line terminals and ground	+1050 kVp .	NA	NA	NA
iv)	Rated switching impulse withstand voltage (250/2500 µs) Dry &wet Between terminals with circuit breaker open voltage of opposite polarity on the other terminal	900 kVp impulse on one terminal & 345 kVp power frequency	NA	NA	NA

Sl. No.	Parameter	400kV system	220kV system	132kV system	33kV system
v)	One minute power frequency dry withstand voltage between line terminals and ground	520 kV rms.	460 kV rms.	275 kV rms	70 kV rms
vi)	One minute power frequency dry withstand voltage between terminals with circuit breaker open	610 kV rms.	460 kV rms.	275 kVrms	70 kV rms
28.	Minimum corona extinction voltage with CB in all positions	320kV rms	156 kV rrms	92 kV rms	
29.	Max. radio interference voltage for frequency between 0.5 MHz and 2 MHz (Micro volts)	1000 µV (at 266kV rms)	1000 µV (at 156kV rms)	500µV (at 92kV rms)	
30.	Minimum Creepage distance				
i)	Phase to ground (25mm/kV)	10500mm	6125mm	3625mm	
ii)	Between CB terminals	10500mm	6125mm	3625mm	
31.	Rated capacitance current switching duty	C2	C2	C2	
32.	Rated Mechanical Endurance duty	M2	M2	M2	

2.14 Isolators (AIS)

The isolators shall comply to IEC 62271-102 in general. 400 kV, 220kV & 132kV isolators shall be double break type, All Isolators and earth switches shall be motor operated. Earth switches are provided at various locations to facilitate maintenance. Isolator rated for 400kV, 220kV, 132kV & 33kV shall be of extended mechanical endurance class-M2 and suitable for bus transfer current switching duty as per IEC-62271-102 Main blades and earth blades shall be interlocked and interlock shall be fail safe type. 400kV, 220kV & 132kV earth switch for line isolator shall be suitable for induced current switching duty as defined for Class-B as per relevant standard.

The Technical Particulars / Parameters of Isolators:

Sl. No.	Description	Unit	420kV Isolator	245kV Isolator	145kV Isolator	33kV Isolator
1	Rated voltage	kVrms	420	245	145	36
2	Rated frequency	Hz	50	50	50	50
3	No. of poles	Nos.	3	3	3	3
4	Design ambient temperature	°C	50	50	50	50
5	Type		Outdoor, AC Motor Operated	Outdoor, AC Motor Operated	Outdoor, AC Motor Operated	Manually Operated
6	Rated current at 50°. C ambient temperature	A	2000A/ 3150A (as applicable)	1600A /2500A (as applicable)	2000A/ 1600A (as applicable)	1200A/ 800A (as applicable)
7	Rated short time withstand current of isolator and earth switch	kA	63 for 1 sec	50 for 1 sec	40 for 1 sec	31.5 for 3 sec
8	Rated dynamic short time withstand current of isolator and earth switch	kAp	157.5 kAp	125 kAp	80kAp	65.5kAp
9	Temperature rise over design ambient temperature	-	-	-	-	-
10	Operating mechanism of isolator/earth switch		A.C. Motor operated	A.C. Motor operated	A.C. Motor operated	Manually Operated
11	Max. Operating time	secs	20 secs or less	12 secs or less	12 secs or less	NA
12	Rated Insulation levels					
a)	Full wave impulse withstand voltage (1.2/50 microsec.)					
i)	between line terminals and ground	kVp	±1425	±1050	±650	±170

Sl. No.	Description	Unit	420kV Isolator	245kV Isolator	145kV Isolator	33kV Isolator
ii)	between terminals with isolator open	kVp	±1425 kVp impulse on one terminal and 240 kVp power frequency voltage of opposite polarity on other terminal	±1200	±750	±195
b)	Switching impulse withstand voltage (250/2500 micro-second) dry and wet					
i)	between line terminals and ground	kV peak	± 1050	-NA	-NA	NA
ii)	between terminals with Isolator open	kV peak	900 kVp impulse on one terminal and 345 kVp power frequency voltage of opposite polarity on other terminal	-NA	-NA	-NA
c)	One minute power frequency dry withstand voltage					
i)	between line terminals and ground	kV rms	520	460	275	70
ii)	between terminals with isolator open	kV rms	610	530	315	-
13	Minimum Corona extinction voltage with Isolator in all positions	KV rms	320	156	92	-
14	Max. radio	Micro	500 at	500 at	500 at 92	-

Sl. No.	Description	Unit	420kV Isolator	245kV Isolator	145kV Isolator	33kV Isolator
	interference voltage for frequency between0.5 MHz and 2 MHz in all positions	volts	320 kVrms	156 kVrms	kVrms	
15	Seismic acceleration		As per	As per	As per	-
			IS:1893	IS:1893	IS:1893	
16	Thermal Rating of Auxiliary Contacts	A	10 A at 220 V DC	10 A at 220 V DC	10 A at 220 V DC	10A at 220V DC
17	Breaking Capacity of auxiliary contacts		2 A DC with circuit time constant not less than 20 ms	2 A DC with circuit time constant not less than 20 ms	2 A DC with circuit time constant not less than 20 ms	2A DC with circuit time constant not less than 20ms
18	System neutral earthing		Effectivel y Earthed	Effectivel y Earthed	Effectivel y Earthed	Effectively earthed

2.15 Current Transformers (AIS)

Current Transformers shall comply with IEC 60044-1 in general. All ratios shall be obtained by secondary taps. Generally, Current Transformers (CT) for 400kV & 220 kV shall have six cores (four for protection and two for metering) and for 132kV shall have five cores (three nos. for Protection & two nos. for metering). The burden and knee point voltage shall be in accordance with the requirements of the system including possible feeds for telemetry. Accuracy class for protection core shall be PS and for metering core it shall be 0.2S. The rated burden of cores shall be closer to the maximum burden requirement of metering & protection system (not more than 20VA for metering core) for better sensitivity and accuracy. The instrument security factor shall be less than 5 for CTs upto 400 kV voltage class.

The Technical Particulars / Parameters of Current Transformers:

Sl. No.	Description	400kV system	220kV system	132 kV system	33 kV system
1	Rated voltage, Um (kVrms)	420	245	145	36
2	Rated frequency (Hz)	50	50	50	50
3	No. of Poles	1	1	1	1
4	Design ambient temperature (°C)	50	50	50	50
5	Rated Primary Current	3150-	1600-	1250-	1200/1A

Sl. No.	Description	400kV system	220kV system	132 kV system	33 kV system
	(A)	1000/1A	800/1A	400/1A	(for Xmr) 400/1A (for feeder)
6	Rated extended primary current	125%	125%	125%	125%
7	Rated short time thermal withstand current (kA)	63 for 1 sec	50 for 1 sec	40 for 1 sec	31.5 for 3 Sec
8	Rated dynamic current	157.5 kAp	125 kAp	80 kAp	65.5 kAP
i)	between line terminals and ground (kVpeak)	±1425	±1050	±650	±170
i)	between line terminals and ground (kVpeak)	± 1050	-NA-	-NA-	-NA-
i)	between line terminals and ground (kVrms)	630 (dry only)	460	275	70
9	No. of Cores	6 (4 nos. for Protection & 2 nos. for metering)	6 (4 nos. for Protection & 2 nos. for metering)	5 (3 nos. for Protection & 2 nos. for metering)	4for Xmr. (2 No. for protection 2 No.for metering) 2 for feeder (1 No.for protection, 1 No.for metering)

2.16 Capacitor Voltage Transformers (CVT) / Potential Transformers (PT)

Capacitive Voltage transformers shall comply to IEC-61869 in general. These shall have three secondaries out of which two shall be used for protection and one for metering. Accuracy class for protection cores shall be 3P and 0.5 and for metering core shall be 0.2. The voltage transformers on lines shall be suitable for Carrier Coupling. The Capacitance of CVT shall be 4400/8800 pF depending on PLCC requirements. The rated burden of cores shall be closer to the maximum burden requirement of metering & protection system (not more than 100 VA for metering core) for better sensitivity and accuracy.

The Technical Particulars / Parameters of Capacitor Voltage Transformers:

Sl. No.	Description	420kV CVT	245kV CVT	145kV CVT	36kV PT
1	Rated primary voltage (kV rms)	420	245	145	36

Sl. No.	Description	420kV CVT	245kV CVT	145kV CVT	36kV PT
2	Rated frequency (Hz)	50	50	50	50
3	No. of Poles	1	1	1	1
4	Design ambient temperature (°C)	50	50	50	50
5	System fault level (kA for 1 sec)	63 for 1 sec	50 for 1 sec	40 for 1 sec	31.5 for 3 sec.
6	Standard reference range of frequencies for which the accuracy are valid	96% to 102%for protection and 99% to 101 % for measurement		-	
7	High frequency capacitance for entire carrier frequency range (for CVT only)	Within 80% to 150% of rated capacitance		-	
8	Equivalent series resistance over entire carrier frequency range (for CVT)	Less than 40 Ohms		-	
9	Stray capacitance and stray conductance of HF terminal over entire carrier frequency range (for CVT)	As per IEC-60358		-	
10	Temperature rise over design ambient temperature	As per IEC-61869			
11	Rated Insulation levels				
a)	Full wave impulse withstand voltage (1.2/50 microsec.)				
i)	between line terminals and ground	±1425 kVp	±1050 kVp	±650 kVp	±170kVP
ii)	between terminals with isolator open	±1425 kVp impulse on one terminal and 240 kVp power frequency voltage of opposite polarity on other terminal	±1200 kVp	±750 kVp	
b)	Switching impulse withstand voltage (250/2500 micro-second) dry and wet				
i)	between line terminals and ground	± 1050 kVp	-NA	-NA	-NA-
ii)	between terminals with Isolator open	900 kVp impulse on	-NA	-NA	-NA-

Sl. No.	Description	420kV CVT	245kV CVT	145kV CVT	36kV PT
		one terminal and 345 kVp power frequency voltage of opposite polarity on other terminal			
c)	One minute power frequency dry withstand voltage				
i)	between line terminals and ground (kVrms)	630 (dry only)	460	275	70
d)	One minute power frequency withstand voltage between secondary terminals & earth				
i)	between LV (HF) terminal and earth terminal (kVrms)	10kVrms for exposed terminals and 4kVrms for terminals enclosed in a weather proof box			
ii)	For secondary winding	3kVrms			5kVrms
12	Max. radio interference voltage for frequency between0.5 MHz and 2 MHz at (microvolts)	1000 at 266kV rms	1000 at 156kV rms	500 at 92kV rms	-NA-
13	Minimum Corona extinction voltage (kVrms)	320	176	106	-NA-
14	Partial Discharge	As per IEC	As per IEC	As per IEC	As per IEC
15	Type	Single phase Electromagnetic or capacitor VT			
16	No. of secondaries	3 cores	3 cores	3 cores	2 cores
17	Rated voltage factor	1.2 - continuous 1.5 -30 seconds	1.2 - continuous 1.5 -30 seconds	1.2 - continuous 1.5 -30 seconds	1.2 continuous 1.5-30 sec.
18	Phase angle error	± 10 minutes (For metering core)	± 10 minutes (For metering core)	± 10 minutes (For metering core)	± 10 mintutes(for metering core)
19	Capacitance (pf) (for CVT)	8800/4400 (+10%/-5%)	8800/4400 (+10%/-5%)	4400 (+10%/-5%)	-
20	Core details	Core-1, Core-2 & Core-3	Core-1, Core-2 & Core-3	Core-1, Core-2 & Core-3	Core 1 & Core 2
a)	Voltage Ratio	Core-1:- (400/√3)/(0.11/√3) Core-2:- (400/√3)/(0.	Core-1:- (220/√3)/(0.11/√3) Core-2:- (220/√3)/(0.	Core-1:- (132/√3)/(0.11/√3) Core-2:- (132/√3)/(0.	Core1- 33kV/ √3/0.11/√3 Core2-33 √3/0.11/√3

Sl. No.	Description	420kV CVT	245kV CVT	145kV CVT	36kV PT
		11/√3) Core-3:- (400/√3)/(0. 11/√3)	11/√3) Core-3:- (220/√3)/(0. 11/√3)	11/√3) Core-3:- (132/√3)/(0. 11/√3)	
b)	Application	Core-1:- Protection Core-2:- Protection Core-3:- Metering	Core-1:- Protection Core-2:- Protection Core-3:- Metering	Core-1:- Protection Core-2:- Protection Core-3:- Metering	Core1- protection Core2- Metering
c)	Accuracy	Core-1:-3P Core-2:-3P Core-3:- 0.2	Core-1:-3P Core-2:-3P Core-3:- 0.2	Core-1:-3P Core-2:-3P Core-3:- 0.2	Core1- 3P Core2-0.2
d)	Min. Output burden (VA)	Core-1:- 100VA Core-2:- 100VA Core-3:- 100VA	Core-1:- 100VA Core-2:- 100VA Core-3:- 100 VA	Core-1:- 100VA Core-2:- 100VA Core-3:- 100 VA	Core1- 100VA Core2- 100VA
21	Rated Total Thermal Burden (VA)	300 VA (100 VA/winding)		-	
22.	Minimum Cantilever Strength	500 KG			

2.17 Surge Arresters (AIS)

Station class, heavy duty gapless type Surge arresters conforming to IEC 60099-4 in general shall be provided. The rated voltage of Surge arrester and other characteristics are chosen in accordance with system requirements. Surge arresters shall be provided near line entrances, Transformers & Reactor so as to achieve proper insulation coordination. Porcelain/Polymer housing if provided for SA shall be fitted with pressure relief devices and diverting ports suitable for preventing shattering of Porcelain/Polymer housing provide path for the flow of rated currents in the event of arrestor failure. A leakage current monitor with surge counter shall be provided with each surge arrestor.

The Technical Particulars / Parameters of Surge Arresters:

Sl. No.	Description	Unit	420kV SA	245kV SA	145kV SA	36kV SA
1	Nominal System Operating voltage	kV, rms	400	220	132	33
2	Rated frequency	Hz	50	50	50	50
3	No. of Poles	No.	1	1	1	1
4	Design ambient	°C	50	50	50	50

Sl. No.	Description	Unit	420kV SA	245kV SA	145kV SA	36kV SA
	temperature					
5	Rated arrester voltage	kV	336	198	120	30
6	Continuous operating voltage at 50°.C	kV	267	168	96	24
7	Nominal discharge current		20 kA of 8/20 microsec ond wave	10 kA of 8/20 microsec ond wave	10 kA of 8/20 microsec ond wave	10kA of 8/20 micro sec. wave
8	Discharge current at which insulation co-ordination will be done		20 kA of 8/20 microsec ond wave	10 kA of 8/20 microsec ond wave	10 kA of 8/20 microsec ond wave	10kA of 8/20 micro sec. wave
9	Minimum discharge capability (referred to rated arrester Voltage) or corresponding to minimum discharge voltage as per clause-2.0 (d) whichever is higher	kJ/kV	12kJ/kV	5kJ/kV	5kJ/kV	2.83kJ/kV
10	Max. switching surge residual voltage	kVp	670 (at 2kA) 650 (at 500A)	500 (at 1kA)	280 (at 1kA)	
11	Max. residual voltage at					
i)	5kA	kVp	-	560	310	
ii)	10 kA nominal discharge current	kVp	800	480	300	90
iii)	20 kA nominal discharge current	kVp	850	-	-	-
12	Cantilever Strength (for 1 minute withstand test)	kg	1000	1000	1000	300

2.18 33kV Shunt Capacitors:

The 36kV, 12MVAr Shunt Capacitor Banks shall be connected in double star formation and each star connected bank shall be unearthed with a floating neutral, but interconnected by a neutral protective current transformer (NCT) of suitable ratio to operate protective relay at its 20% current setting whenever one capacitor unit fails.

The Technical Particulars / Parameters of 36kV Shunt Capacitor Bank:

Sl.No.	Particulars	Parameters
1	Nominal System Voltage	33 kV
2	Highest System Voltage	36 kV
3	Rated capacitor bank voltage	36 kV
4	Basic Insulation level	170 kVp
5	P.F. withstand voltage	70 kV
6	Type of connection	Double Star
7	Rating of Shunt Capacitor at highest voltage	12 MVAR
8	Number of phases	3
9	KVAR and voltage rating of each unit	166.67 KVAR / 6.93 kV
10	Total number of units in each bank of 12MVAR	72
11	Total number of Series Group per phase per Star group	3
12	Number of units in parallel per series group per phase	4
13	Type of fuse	Internal Fuse

2.19 Protection & Control

The protective relaying system proposed to be provided for transmission lines, auto-transformers, reactors and bus bars to minimize the damage to the equipment in the events of faults and abnormal conditions, is dealt in this section. All main protective relays shall be numerical type with IEC 61850 communication interface. All numerical relays shall have built in disturbance recording feature. The auto transformer protection should be provided with two no. differential relays of different make &algorithm.

The protection circuits and relays of transformer and reactor shall be electrically and physically segregated into two groups each being independent and capable of providing uninterrupted protection even in the event of one of the protection groups failing, to obtain redundancy, and to take protection systems out for maintenance while the equipment remains in service.

a) Transmission Lines Protection

400kV and 220kV lines shall have MAIN-I numerical four zones distance protection scheme with carrier aided inter-tripping feature. The fourth zone shall be the reverse zone. 400 kV and 220 kV lines shall also have MAIN-II numerical distance protection scheme like Main-I but from different make that of MAIN-I. 132kV lines shall have MAIN-I numerical four zones distance protection scheme with carrier aided inter-tripping feature. The fourth zone shall be the reverse zone. 132 kV lines shall also have independent back up over current & earth fault protection. However, Line Current Differential relay (with back up distance protection feature) as Main–I & Main-II may be considered, for short lines (line length less than 10 KM) having Fibre Optic communication link for which line differential relay have to be arrange by Transmission Service Provider (TSP) for remote end also. In case of loop in loop out of transmission lines, the existing protection scheme shall be studied and suitable up-gradation (if required) shall be carried out. The Main-I and Main-II protection relays of same make may be provided only if they are of different hardware, manufacturing platform or different principle of operation. Associated power & control cabling and integration with SAS at remote end shall be provided by respective bay owner.

All 400kV lines shall also be provided with two stages over voltage protection. Further, all 400kV & 220kV lines shall be provided with single and three phase auto-reclosing facility to allow reclosing of circuit breakers in case of transient faults. 132kV lines should not have auto-reclosing facility. These lines shall also be provided with distance to fault locators to identify the location of fault on transmission lines.

Over voltage protection & distance to fault locator may be provided as in-built feature of Main-I & Main-II protection relays. Auto reclose as built in function of Bay Control Unit (BCU) is also acceptable.

The Main-I and Main-II protection relays shall be fed from separate DC sources and shall be mounted in separate panels. For 400kV, 220kV and 132kV transmission lines, directional IDMT earth fault relay should be provided as standalone unit or in-built feature of Main-I and Main -II feature.

b) Auto Transformer Protection/Transformer protection:

These shall have the following protections:

(i) Numerical Differential protection
(400/220 KV and 220/132 KV ICTs shall have two differential protection relays. The second differential relay shall be provided on IV side C&R panel to avoid congestion on HV side C&R panel. The differential relay shall have different make and algorithm.)

(ii) Numerical Restricted earth fault protection
(iii) Numerical Over-current and earth fault protection on HV & MV side
(iv) Numerical Over fluxing protection on HV & MV side
(v) Numerical Overload alarm
(vi) Neutral displacement

Further, Numerical Back-up Over-current and earth fault protection on HV & MV side of auto-transformer shall not be combined with other protective functions in the main relays and shall be independent relays. Besides these, power transformers shall also be provided with BUCHOLZ relay, protection against high oil and winding temperature and pressure relief device, OSR etc. The auto transformer protection should be provided with two no. differential relays of different make & algorithm.

Suitable monitoring, control (operation of associated circuit breaker & isolator) and protection for LT auxiliary transformer connected to tertiary winding of auto-transformer for the purpose of auxiliary supply shall be provided. The Over current and other necessary protection shall be provided for the auxiliary transformer. These protection and control may be provided as built in feature either in the bay controller to be provided for the auxiliary system or in the control & protection IEDs to be provided for autotransformer.

c) 400 kV Reactor Protection

Reactor shall be provided with the following protections:
(i) Numerical Differential protection.
(ii) Numerical Restricted earth fault protection
(iii) Numerical Back-up impedance protection
(iv) Numeric back up – over current & Earth fault protection

Besides these, reactors shall also be provided with Buchholz relay, protection against oil and winding temperatures & pressure relief device etc.

d) Numerical Bus Bar Protection

The high speed low impedance bus bar differential protection, which is essential to minimize the damage and maintain system stability at the time of bus bar faults, shall be provided for 400kV, 220kV and 132kV buses. Duplicated bus bar protection is envisaged for 400kV bus-bar protection. Bus bar protection scheme shall be such that it operates selectively for each bus and incorporate necessary features required for ensuring security. The scheme shall have the complete bus bar protection for present as well for present as well as for future bays envisaged i.e. input / output modules for future bays shall also be provided. Bus bar protection system for new substation shall be de-centralized (distributed) type. For existing substations, the existing bus bar protection shall be augmented wherever required.

e) Numerical Local Breaker Back up Protection

This shall be provided for each 400kV, 220KV and 132kV breakers and will be connected to de-energize the affected stuck breaker from both sides.

f) Substation Automation System (optional)

For new substations, state of art Substation Automation System (SAS) conforming to IEC-61850 may be provided by TSP as per requirement. The distributed architecture shall be used for Substation Automation system, where the controls shall be provided through Bay control units. The Bay control unit is to be provided bay wise for voltage level 132kV and above. All bay control units as well as protection units are normally connected through an Optic fiber high speed network. The control and monitoring of circuit breaker, dis-connector, re-setting of relays etc. can be done from Human Machine Interface (HMI) from the control room. The functions of control, annunciation, disturbance recording, event logging and measurement of electrical parameters shall be integrated in Substation Automation System.

At new substations, the Substation Automation System (SAS) shall be suitable for operation and monitoring of the complete substation including proposed future bays/elements.

At existing substations with Substation automation system (SAS), augmentation of existing SAS shall be done for bays under present scope. At existing Substations where Substation automation is not provided, control functions shall be done through control panels.

Necessary gateway, modems, data channel (as required) shall be provided to send data to SLDC & backup SLDC & TRANSCO SCADA CENTER through IEC 60870-5-104/101 protocol and data points as per SLDC requirements. Any augmentation work at SLDC is excluded from TSP's scope. However, all the configuration work at substation end required to send data to SLDC & TRANSCO SCADA CENTER shall be in the scope of TSP.

g) Time synchronization equipment

Time synchronization equipment complete in all respect including antenna, cable, processing equipment required to receive time signal through GPS or from National Physical Laboratory(NPL) through INSAT shall be provided. This equipment shall be used to synchronize SAS, PMUs & IEDs etc.

2.20 Control Concept

All the EHV breakers in substation/switching stations shall be controlled and synchronized from the switchyard control room and remote control center. Each

breaker would have two sets of trip circuits which would be connected to separately fused DC supplies for greater reliability. All the isolators shall have control from remote/local whereas the earth switches shall have local control only.

2.21 PLCC & PBAX

Power line carrier communication (PLCC) equipment complete for speech, tele-protection commands and data channels shall be provided on each transmission line. The protections for transmission line and the line compensating equipment shall have hundred percent (100%) back up communication channels i.e. two channels for tele-protection in addition to one channel for speech plus data for each direction. The PLCC equipment shall in brief include the following:-

- Coupling device, line traps, carrier terminals, protection couplers, HF cables, PABX (if applicable) and maintenance and testing instruments.

- At new substation, a telephone exchange (PABX) of 24 lines shall be provided at as means of effective communication among various buildings of the substation, remote end substations and with control centers (SLDC) etc.

- Coupling devices shall be suitable for 8800/4400pF for 400kV CVT with phase to phase coupling, 8800/4400pF for 220kV CVT with phase to phase coupling. The pass band of coupling devices shall have sufficient margin for adding communication channel in future if required. Necessary protection devices for safety of personnel and low voltage part against power frequency voltages and transient over voltage shall also be provided.

- The line traps shall be broad band tuned suitable for blocking the complete range of carrier frequencies. Line Trap shall have necessary protective devices such as lightning arresters for the protection of tuning device. Decoupling network consisting of line traps and coupling capacitors may also be required at certain substation in case of extreme frequency congestion.

- The carrier terminals shall be of single side-band (SSB) amplitude modulation (AM) type and shall have 4 kHz band width. PLCC Carrier terminals and Protection couplers shall be considered for both ends of the line.

- PLCC equipment for all the transmission lines covered under the scheme (consisting of one set of analog PLCC channel along with circuit protection coupler and one set of Digital protection coupler for both ends) shall be provided by TSP. CVT & Wave trap for all line bays under present scope shall be provided by TSP.

- TSP shall provide/undertake necessary addition/modification/shifting/re-commissioning etc. of PLCC equipment due to LILO of transmission lines (wherever applicable).

- All other associated equipment like cabling, coupling device and HF cable shall also be provided by the TSP.

- Adequate number of Fiber Optic/OPGW based terminal equipments are required to be provided at each Substation under present scope of work and the same shall be utilized for Data, Voice and line protection applications. For protection purposes, both end Digital Protection Couplers (DPCs) shall be included at both ends. However, for line protection application, back up communication channel/link may be considered as per requirement so as to take care of OPGW/Telecommunication equipment outage.

  Bidders are also required to familiarize themselves with the protection & communication scheme of existing transmission lines. Before finalizing the Protection scheme and Sub-Station Automation system, bidder is requested to get fully familiarized with the site condition and General arrangement & scheme etc of the existing Substations.

2.22 Substation Support facilities

Certain facilities required for operation & maintenance of substations as described below shall be provided in new substation. In existing substation, these facilities have already been provided and would be extended/ augmented, wherever required.

2.23 AC & DC power supplies

For catering to the requirements of three phase & single phase AC supply and DC supply for various substation equipment's, the following arrangement is envisaged. However, for substation extension / augmentation, existing facilities shall be augmented as required -

i) For LT Supply at 400/220kV New Substation, two (2) nos. 500 kVA, 33/0.4kV Transformers shall be provided which shall be connected with two different sources either on 33kV bus of substation or on DISCOM supply or on tertiary of 400/220/33kV Auto-transformer. The maximum permissible losses shall be as per Table 6 of IS-1180.

ii) For LT Supply at 220/132kV New Substation, two (2) nos. 200 kVA, 33/0.4kV Transformers shall be provided which shall be connected with two different sources either on 33kV bus of substation or on DISCOM supply or on tertiary of 220/132/33kV Auto-transformer. The maximum permissible losses shall be as per Table 6 of IS-1180.

iii) For LT Supply at 220/33kV or 132/33kV New Substation, one (1) No. 200 kVA, 33/0.4kV Transformer shall be provided which shall be connected on 33kV bus of substation. The maximum permissible losses shall be as per Table 6 of IS-1180.

iv) Metering arrangement with Special Energy Meters (SEMs) shall be provided by TSP at 33kV tertiary of Transformer for drawing auxiliary supply at new substation. Such SEMs may be provided by STU at the cost of the TSP. Accounting of such energy drawn by the TSP shall be done by SLDC as part of State Energy Accounting. Additionally, Active Energy Meters may be provided at the same point in the 33kV tertiary of Transformer by local SEB/DISCOM for energy accounting,

v) 2 Sets batteries of 220V for control & protection and 2 Sets 48V batteries for PLCC/ Communication equipment shall be provided at each new Substation with at least 10 hours battery backup and extended back up as required. Each battery bank would have a float-cum-boost charger. Battery shall be of VRLA type.

vi) Suitable AC & DC distribution boards and associated LT Switchgear would be provided at new Substations. Sizing of LT Switchgear shall be suitable to cater the requirement for all present and future bays. AC & DC distribution boards shall have modules for all the present and future feeders as specified.

For Substation Extensions, existing facilities shall be augmented as required. For new substations following switchboards shall be considered with duplicate supply with bus coupler/ sectionalizer and duplicate outgoing feeders except for Emergency lighting distribution board which shall have only one incoming feeder:

(a) 415V Main Switch board – 1 no.
(b) AC distribution board – 1 no.
(c) Main lighting distribution board – 1no.
(d) Emergency lighting distribution board – 1no.
(e) 220 Volt DC distribution board – 2nos.
(f) 48 Volt DC distribution board – 2nos.

415V Main Switch Board & AC distribution board shall be provided with at least two incomers with one bus coupler and AC supply shall have redundancy.

vii) In new Substations, one No. 250 KVA DG set shall be provided for emergency applications.

vii) Sizing of Auxiliary system (like battery, charger, LT switchgear) may be done considering future bay requirements to avoid replacement in future with higher sizes.

2.24 Installation of Interface ABT Meters:

a. Metering (Main & Check at arrangement with AMR facility shall be provided on the LV side of EHV Power Transformers i.e. 33kV side of 220/33kV & 132/33kV transformers installed in EHV substations.

b. The standby metering with AMR facility shall be provided on the HV side of EHV Power transformers i.e.220/33kV, 132/33kV and 132/1lkV transformers

installed in EHV substations.

c. In case of EHV consumers of Distribution Licensee directly connected with 220kV or 132kV Substation of Licensee, tariff metering with AMR facility shall be provided on outgoing feeder emanating from EHV substation of Licensee. In case of Railway Traction feeders, standby meters with AMR facility shall be provided at Licensee substation.

d. The Interface meters shall be of open protocol confirming to IS 15959 and of point 0.2S accuracy class. The accuracy class of Current transformers (CTs) and voltage transformers (VTs) shall not be inferior to that of associated meters. The meters shall have a non-volatile memory in which following shall be automatically stored: -

- Average frequency for each successive 15/5 minutes block, as a two digit code (00 to 99 for frequency from 49.0 to 51.0Hz).
- Net Watthour transmitted during each successive 15/5 minutes block, up to second decimal, with plus/minus sign.
- Cumulative Watthour transmittal at each midnight, in six digits including one decimal.
- Cumulative VArh transmittal for voltage high condition, at each midnight, in six digits including one decimal.
- Cumulative VArh transmittal for voltage low condition, at each midnight, in six digits including one decimal.
- Date and time blocks of failure of VT supply on any phase, as a star (*) mark.
- The interface meters shall have the provision of recording of energy in 15 minutes' time block as well as 5 minutes' time block as configured through software. In addition to the existing provisions of frequency resolution of 0.01Hz and they must be capable of recording Voltage and Reactive Energy at every 5 minute and have feature of auto-time synchronization through GPS.

e. The provisions of MPEGC (Revision-II), 2019 and CEA (Installation and operation of Meters) Regulation 2006 and subsequent amendments thereof shall be applicable for metering of interface points.

2.25 Fire Fighting System

Fire-fighting system in general conforms to fire insurance regulations of India. The fire-fighting system is proposed with both AC motor & diesel engine driven pump house in a fire fighting pump house building along with water storage tank of adequate capacity and oil soak pit of adequate capacity to drain transformer oil in case of fire. Automatic heat actuated emulsifying system to be provided for fire protection of Transformers. However, Nitrogen Injection Fire Protection System (NIFPS) shall be required for 400 kV and 220 kV Class Transformers. In addition, for alarm system based on heat/smoke detectors are proposed to be installed at

sensitive points in a substation e.g. Cable Vault, Control Room building and other buildings etc. Further, adequate water hydrants and portable fire extinguishers shall be provided in the substations. The main header of firefighting system shall be suitable for extension to bays covered under the future scope; necessary piping interface in this regard shall be provided.

Optical Beam type heat detection for GIS hall fire protection system shall be provided for all the GIS halls. All fire protection system shall also comply with the requirement of CEA (Measures Relating to Safety & Electric Supply) regulations.

2.26 Oil evacuating, filtering, testing & filling apparatus

To monitor the quality of oil for satisfactory performance of transformers, shunt reactors and for periodical maintenance necessary oil evacuating, filtering, testing and filling apparatus would be provided at new substations. Oil tanks of adequate capacities for storage of transformer oil would be provided.

2.27 Illumination

Normal & emergency AC & DC illumination shall be provided adequately in the control room & other buildings of the substation. The switchyard shall also be provided with adequate illumination.

The entire control room building, fire-fighting pump house, other buildings (if any) and switchyard shall be done by LED based low power consumption luminaries.

2.28 Control Room

Substation control room shall be provided to house substation work station for station level control (SAS) along with its peripheral and recording equipment's, AC & DC distribution boards, DC batteries & associated battery chargers, Fire Protection panels, Telecommunication panels & other panels as per present requirements. Air conditioning shall be provided in the building as functional requirements. Main cable trenches from the control room shall have adequate space provision for laying of cables from control room for all the future bays also.

2.29 GIS hall

The Gas Insulated Switchgear (GIS) of each voltage other associated equipment shall be housed separately and inside in the GIS buildings. The panels i.e. Bay level units, bay mimic, relay and protection panels, RTCC panels, PLCC panels etc. are to be placed in a separate room in the GIS building. The size of the room shall be such that all the panels for the bays/diameters under present scope and future bays/diameters shall be accommodated in the above room. The panel room shall be air-conditioned. Further, the temperature of the room shall be monitored through substation automation system by providing necessary temperature

transducers. Ventilation system of suitable capacity shall be provided for each GIS hall.

One EOT Crane each for GIS hall of suitable capacity shall be provided for erection &Maintenance of largest GIS component/assembly and all plant installed in the GIS switchgear room. The crane shall capable of fulfilling all special requirements for erection & maintenance of GIS equipment. The capacity of the crane shall be sized to lift the heaviest GIS switchgear component.

2.30 PT Distribution Scheme

A suitable PT distribution scheme for 400kV, 220 kV & 132 kV has to be provided by TSP. TSP may visit the existing Sub-Stations in order to familiarize themselves with the existing system. The PT distribution board must be suitable for distributing the main bus PTs to all the feeder/transformers. The Potential transformers shall comply with the relevant codes/standards. The number of secondary cores, accuracy class and burden shall be in accordance with the requirements of the protection and metering system. Rated burden shall be nearest to the burden computed; however it shall not exceed 50 VA. The accuracy class for metering core shall be equal to or better than the accuracy class of the meter specified in the Central Electricity Authority (Installation and Operation of Meters) Regulations. Digital optical voltage transformers shall also be acceptable in place of conventional voltage transformers.

2.31 Visual monitoring system (VMS) for watch and ward of substation premises:

Visual monitoring system for effective watch and ward of substation premises shall cover all the transformers and reactors, all other major AIS Equipment (such as CB, isolators, CT, CVT, SA etc. as applicable), GIS bays, panel room, all the gates of switchyard and all entry and exit points of control room building and accordingly the location of cameras shall be decided. The camera shall be high definition color CCD camera with night vision feature. The VMS data partly/completely shall be recorded (minimum for 15 days) at least @25fps (or better) and stored on network video recorder. The system shall use video signals from various cameras installed at different locations, process them for viewing on workstations/monitors in the control room and simultaneously record all the cameras. Mouse/keyboard controllers shall be used for pan, tilt, zoom and other functions of the desired camera. The Visual Monitoring System shall have provision of WAN connectivity for remote monitoring.

All camera recordings shall have Camera ID & location/area of recording as well as date/time stamp. The equipment should generally conform to Electromagnetic compatibility requirement for outdoor equipment in EHV substation. At existing substations, the visual monitoring system if available shall be augmented as per existing or better specification as required.

2.32 Fibre Optic Communication Network

The Fibre Optic Communication Network configuration and the equipment characteristics for communication system to be installed under the project as per relevant IS standard & CEA Guidelines. The sub-systems addressed within this section are:

1. Fibre Optic Transmission System (FOTS).
2. Termination Equipment Subsystems.
3. Network Management System (NMS).
4. MDF, DDF and Cabling.

The above are applicable to and in support of network configurations and Network Management System (NMS) for monitoring and control of the communication network. TMN/NMS and NMS have been interchangeably used in this specification. The security related requirements of the equipment shall be as per DoT (Department of Telecommunication) guidelines and all similar security requirements as amended by DoT on time to time basis shall be followed/complied by the TSP at no additional cost to MPPTCL till the implementation of the project. It shall be the responsibility of TSP to integrate the Fibre Optic Terminal Equipment's to existing MPPTCL Fibre Optic Network and NMS System and all necessary SFP/interface equipment's (if any) for integration, are to be arranged by TSP.

2.33 Phasor Measurement Unit (PMU)

The substations/Generating stations are provided with CTs on each bay of the switchyard and CVTs/PTs in each transmission line bay and on each bus. The CTs have one metering core and four protection cores. The CVTs are provided with three cores for metering/protection. The offered Phasor Measurement Unit (PMU) shall be connected to either of these CT and CVT cores. PMUs shall be suitable for measurement on both the cores (Meter & Protection).

The PMUs to be installed at the Substations / Power stations, shall communicate to the existing Phasor Data Concentrator (PDC) installed at SLDC as per IEEE C37.118.1-2011, IEEE C37.118.2-2011 & C37.118.1a-2014 standard or IEC/IEEE 60255-118-1:2018 Standard with all amendments. PMU complying IEC/IEEE 60255-118-1:2018 Standard shall be preferred. The PMU shall be capable of reporting with its full features to the existing PDC installed at SLDC under the Unified Real Time Dynamic State Monitoring (URTDSM) Project. The PMU's are to be provided for each feeder bays and transformers in 400kV & 220kV substations as well as specifically identified 132kV substations and the data is to be transferred through single channel to SLDC. The details of existing PDC installed at SLDC is as under:

Contract Item No as per BOQ		Main and Backup SLDCs : B.4 a, c, d, e
Application		Real Time PDC, Analytics Server and PDS (Part-1)
Sr.No.	Item	Characteristics
1	Manufacturer	CISCO
2	Model	C240-M3
3	Application	Real Time PDC and Analytics
4	Country of Origin	America(North & Latin)/Europe
5	No. of CPU and Cores: 2 x 8 cores	2 x 10C Processor, E5-2670v2, 2.5GHz (2 Socket)
6	Installed 128 GB	8 x 16 GB DDR3 (128 GB), 12 DIMM Slots per Processor Socket total of 24 DIMM Slots
7	Internal Auxillary Memory : 500 Gb Delivered expendable upto 1 TB	2 x 600GB 15K , SAS HDDs. (RAID 1), 16 no. HDD Slots
8	Internal optical drive : DVD (R+W)	DVD +/-RW, SATA, External (HP Make)
9	Input Ports :2 x 1Gbps Ethernet Ports (Minimum)	4 x 1Gb Ethernet Ports
10	Power Supply : Dual AC Power Supply	DualPower Supply, 650W
11	User interface : Through a common TFT monitor , keyboard & mouse connected through KVM Switch in a server rack	Yes
12	Mounting : Rack mountable	Yes, 2U

2.34 Remote Terminal Unit (RTU)

The TSP shall provide the complete RTUs, interface cabinets, transducers, Multi-Function meters, cabling, installation and implementation and associated support requirements.

The TSP is required to provide the data to SLDC & backup SLC and TRANSCO SCADA CENTER either through IEC gateway of Substation Automation System (SAS) or through separate RTUs. In case telemetry to SLDC/ TRANSCO SCADA CENTER is to be provided through RTU, then TSP shall provide complete RTU, interface cabinets, transducers/MFMs, modems for both ends, data channel, and integration with SLDC through IEC 60870-5-104/101 protocol along with support requirement with support requirement. The Modems and Data Channels required for TRANSCO SCADA shall be in the scope of TSP.

3.0 GENERAL FACILITIES

Following facilities shall be provided:

- Substation Gantry/Towers are envisaged for present scope of bays only. However, for adjacent future bay, gantry/towers shall be designed for extension (considering Quad conductor for 400kV future lines, Single conductor for 220kV & 132kV future lines) wherever required.
- The sub-station shall be confirming to the requirement of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2010, as amended from time to time.

- In addition, the scope for development of communication system at the Substations & Transmissions lines is in the scope of TSP. The communication equipment at both ends of the transmission line terminating at MPPTCL's substation, along with its O&M, shall be in the scope of the TSP. For all the new substations, PLCC, Substation Automation System (SAS) & Time synchronization equipment, shall be provided by the TSP as per guidelines & amendments thereof.
- TSP has to arrange for construction power and water on its own.
- Space for storage of O&M spares shall be arranged by TSP on its own.
- Shutdown for crossing of existing transmission lines of STU will be given to TSP free of cost. For any other transmission licensee, TSP has to coordinate with other transmission licensee during the execution stage.

At Transmission Lines:
On the proposed transmission line one OPGW containing 48 Fibers is to be installed by the TSP during the construction of line. The installation of OPGW shall be done from gantry to gantry and shall be terminated in a Joint Box to be provided by TSP at both the ends. OPGW shall be installed as per the design approved of MPPTCL.

At Substations:
TSP shall provide FODP and Approach Cable (48F) for each line which shall be connected with OPGW fibers to be installed on the proposed transmission lines. Further, FODP and approach cable shall also to be provided at all the sub stations for terminating OPGW fibers from lines. TSP (Transmission Service Provider) shall provide STM-16/STM-4 SDH equipment (as per available communication plan of MPPTCL as approved by MPPTCL) at all substations, along with necessary interfaces to meet the voice and data communication requirement and shall be integrated with wideband network of MPPTCL. TSP shall install required no. of Phasor Measurement Units (PMUs) at all 400kV and 220kV substation and specifically identified 132kV substations for all the 400kV, 220kV & 132 kV bays (line/feeders) and transformers of the substation and shall support latest IEEE C-37.118 protocols. These PMUs shall be integrated with the PDC (Phasor Data Concentrator) located at SLDC (State Load Dispatch Center). TSP shall install RTU/SAS with necessary interfaces which shall be integrated with SLDC SCADA System on IEC 60870-5-101/104 protocol. The maintenance of all the communication equipment including FODP and approach cable, PMUs, RTU/SAS shall be the responsibility of TSP.

4.0 SPECIFIC TECHNICAL REQUIREMENTS FOR COMMUNICATION:

A. Laying of OPGW on 400kV, 220kV and 132kV lines:

(1) TSP shall have to install one OPGW containing 48 Fibers on all the lines to be constructed by TSP.

(2) Earth wire during the construction of line. The installation of OPGW shall be done from gantry of one substation up to the gantry of second substation and shall be terminated in a Joint Box to be provided by TSP at both the ends. TSP shall provide FODP and Approach Cable (48F) at both ends which shall be connected with OPGW fibers to be installed on each line:

Sl.No.	Name of the Line / Transmission Element
1	Bisonikala —Sodallpur—Sultanpur 132kV DCSS line.
2	Gairatganj—Pathari 132kV DCDS line
3	Bareli—Badi—Shahganj 132kV DCSS line
4	Ashoknagar—Semrahat—Aron 132kV DCSS line
5	MugaliyaChhap-HOD Bhopal 132kV DCDS line (with Monopole Towers)
6	Khujner—Chhapiheda—Nalkheda 132kV DCSS line
7	Kasrawad—Pipalgaon 132kV DCDS line
8	Sonkatch—ChoubaraDheera 132kV DCSS line
9	Pithampur220—Pithampur (Sector-III) 132kV DCDS line
10	Bahadurpur—Badgaon 132kV DCSS line

(3) TSP shall have to install one OPGW containing 48 Fibers on the following lines (LILO Section) in place of conventional earth wire during the construction of line. The installation of OPGW shall be done from gantry of the new substation up to the LILO point of the existing line and shall be terminated in a Joint Box to be provided by TSP at the substation end. TSP shall provide FODP and Approach Cable (48F) at terminating substations which shall be connected with OPGW fibers to be installed on each LILO section:

Sl.No.	Name of the Line / Transmission Element	Type of OPGW on Existing Line
1	LILO of both circuit of Itarsi (PGCIL) - Bhopal 400kV line (on Twin Moose) at Mandideep GIS 400kV S/s	8 fiber (E) (additional 24 Fiber being added)
2	LILO of Hoshangabad – Adampur 220kV line at Mandideep GIS 400kV S/s	24 fiber (P)
3	LILO of Mandideep – Bhopal 220kV line at Mandideep GIS 400kV S/s	24 fiber (P)
4	LILO of Mandideep132 - Bagroda 132kV line at Mandideep GIS 400kV S/s	24 fiber (P)
5	LILO of Mandideep220 - MACT Bhopal 132kV line at Mandideep GIS 400kV S/s	24 fiber (P)
6	LILO of both circuits of Satpura-Itarsi-Handiya 220kV line at Bisonikala 220kV S/s	24 fiber (P)
7	LILO of SeoniMalwa-Harda 132kV S/c line at Bisonikala	Not Available

Sl.No.	Name of the Line / Transmission Element	Type of OPGW on Existing Line
	220kV S/s	
8	LILO of both circuits of Chhegaon - Nimrani 220kV line at Khargone 220kV S/s	Not Available
9	LILO of Khargone - Julwaniya(Talakpura) 132kV line at Khargone 220kV S/s	Not Available
10	LILO of Bhikangaon - Bistan 132kV line at Khargone 220kV S/s	Not Available
11	LILO of Ashta - Sonkatch 132kV S/C line at Jawarjod 132kV S/s	24 fiber (P)
12	LILO one circuit of Satpura TPS-Itarsi 220 kV line at Shahpur 220/33kV S/s	24 fiber (P)
13	LILO of Badnagar-Orange Berchha 132kV DCSS line at Bhatpachlana 132kV S/s(on Multi Circuit tower).	Not Available
14	LILO of Jaora -Daloda 132kV line at Dhodhar 132kV S/s	Not Available
15	LILO of Barwani – Kukshi 132kV line at Ambaja 132kV S/s	Not Available
(E) – Existing, (P) – Proposed under PSDF Earth Wire replacement scheme		

B. Other SCADA and Communication Equipment:

i. TSP shall provide FODP (96F) and Approach Cable (48/24F) at all the proposed & existing substations under the present scope and repeater station (if any) which shall be connected with OPGW fibers to be installed on the 400 kV, 220 kV and 132 kV transmission lines.

ii. TSP shall provide STM-16 SDH equipment at all the proposed & existing substations under the present scope, and at repeater stations (if any), along with necessary interfaces to meet the voice and data communication requirement and shall be integrated with remote end wideband network of MPPTCL.

iii. In case of repeater requirement, TSP shall provide Repeater shelter along with DG set, provisioning for AC and DC supply and other associated systems.

iv. The integration of Communication equipment with centralized NMS of MPPTCL shall be responsibility of TSP. Configuration work in centralized NMS for integration of new Communication equipment is not in scope of TSP, however all necessary support to integrate new Communication equipment in the Centralized NMS shall be ensured by TSP. The Substations (under present of work) FOTE equipment's are to be integrated with MPPTCL NMS, proposed to be commissioned.

v. TSP shall install required no. of Phasor Measurement Units (PMUs) at each

400kV and 220kV substation and specifically identified 132kV substations for all the 400kV, 220kV & 132 kV bays (line/feeders) and transformers of the substation and shall support latest IEEE C-37.118 protocols. These PMUs shall be integrated with the PDC (Phasor Data Concentrator) located at SLDC (State Load Dispatch Center).

vi. TSP shall install RTU/SAS with necessary interfaces which shall be integrated with SLDC SCADA System on IEC 60870-5-101/104 protocol.

vii. The maintenance of all the communication equipment including FODP and approach cable, PMUs, RTU/SAS & repeater stations shall be the responsibility of TSP.

Schedule: 2

Scheduled COD

[Note: As referred to in the definition of "Element", "Scheduled COD", and in Articles 3.1.3 (c), 4.1 (b) and 4.3 (a) of this Agreement]

S. No	Name of the Transmission Element	Scheduled COD in months from Effective Date	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project	Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element
1	**400/220/132/33kV GIS Substation at Mandideep (District-Raisen)**	24	30%	All Elements from Sl. No. 1(i) to 1(v).
i	Construction of 400/220kV GIS substation at GIS Mandideep			
ii	LILO of both circuit of Itarsi (PGCIL) - Bhopal 400kV line (on Twin Moose) at MandideepGIS400kV S/s			
iii	LILO of both circuits of Hoshangabad - Mandideep - Adampur 220kV line at Mandideep GIS 400kV S/s a. LILO of Hosangabad – Adampur 220kV line at Mandideep GIS 400 kV S/s. b. LILO of Mandideep – Bhopal 220kV line at Mandideep GIS 400 kV S/s.			
iv	LILO of Mandideep132 - Bagroda 132kV line at Mandideep GIS 400kV S/s			
v	LILO of Mandideep220 - MACT Bhopal 132kV line at MandideepGIS400kV S/s			
2	**220/132/33kV substation at Bisonikala (District-Hoshangabad)**	24	6%	All Elements from Sl. No. 2(i) to 2(iii).
i	Construction of 220/132/33kV substation at Bisonikala			
ii	LILO of both circuits of Satpura-Itarsi-Handiya 220kV line at Bisonikala 220kV S/s			

S. No	Name of the Transmission Element	Scheduled COD in months from Effective Date	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project	Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element
iii	LILO of SeoniMalwa-Harda 132kV S/c line at Bisonikala 220kV S/s			
3	**220/132/33kV Substation at Khargone (District-Khargone)**	24	10%	All Elements from Sl. No. 3(i) to 3(iv).
i	Construction of 220/132kV substation at Khargone			
ii	LILO of both circuits of Chhegaon - Nimrani 220kV line at Khargone 220kV S/s			
iii	LILO of Khargone - Julwaniya(Talakpura) 132kV line at Khargone 220kV S/s			
iv	LILO of Bhikangaon - Bistan 132kV line at Khargone 220kV S/s			
4	**132/33kV substation at Sodalpur(District-Harda)**	18	3%	All Elements from Sl. No. 4(i) to 4(ii).
i	Construction of 132/33kV substation at Sodalpur			
ii	Bisonikala – Sodallpur-Sultanpur 132kV DCSS line.			
5	**132/33kV substation at Jawarjod (District-Sehore)**	18	2%	All Elements from Sl. No. 5(i) to 5(ii).
i	Construction of 132/33kV substation at Jawarjod			
ii	LILO of Ashta - Sonkatch 132kV S/C line at Jawarjod 132kV S/s			
6	**132/33kV substation at Pathari (District-Raisen)**	18	3%	All Elements from Sl. No. 6(i) to 6(ii).
i	Construction of 132/33kV substation at			

S. No	Name of the Transmission Element	Scheduled COD in months from Effective Date	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project	Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element
	Pathari			
ii	Gairatganj-Pathari 132kV DCDS line			
7	**132/33kV substation at Badi (District-Raisen)**	18	4%	All Elements from Sl. No. 7(i) to 7(ii).
i	Construction of one No. 132/33kV substation at Badi			
ii	Bareli-Badi-Shahganj 132kV DCSS line			
8	**132/33kV substation at Semrahat (District-Guna)**	18	4%	All Elements from Sl. No. 8(i) to 8(ii).
i	Construction of 132/33kV substation at Semrahat			
ii	Ashoknagar-Semrahat-Aron 132kV DCSS line			
9	**132/33kV GIS substation at HOD Bhopal (District-Bhopal)**	24	10%	All Elements from Sl. No. 9(i) to 9(ii).
i	Construction of 132/33kV GIS Substation at HOD Bhopal			
ii	MugaliyaChhap-HOD Bhopal 132kV DCDS line (with Monopole Towers)			
10	**220/33kV substation at Shahpur (District-Betul)**	24	4%	All Elements from Sl. No. 10(i) to 10(ii).
i	Construction of 220/33kV substation at Shahpur			
ii	LILO one circuit of Satpura TPS-Itarsi 220 kV line at Shahpur 220/33kV S/s			

S. No	Name of the Transmission Element	Scheduled COD in months from Effective Date	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project	Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element
11	**132/33kV substation at Chhapiheda (District-Rajgarh)**	18	3%	All Elements from Sl. No. 11(i) to 11(ii).
i	Construction of 132/33kV substation at Chhapiheda			
ii	Khujner-Chhapiheda-Nalkheda 132kV DCSS line			
12	**132/33kV substation Bhatpachlana (District-Ujjain)**	18	3%	All Elements from Sl. No. 12(i) to 12(ii).
i	Construction of 132/33kV substation Bhatpachlana			
ii	LILO of Badnagar-Orange Berchha 132kV DCSS line at Bhatpachlana132kV S/s (on Multi Circuit tower or separate double circuit towers)			
13	**132/33kV substation at Dhodhar (District-Ratlam)**	18	2%	All Elements from Sl. No. 13(i) to 13(ii).
i	Construction of 132/33kV substation at Dhodhar			
ii	LILO of Jaora -Daloda 132kV line at Dhodhar 132kV S/s			
14	**132/33kV substation at Pipalgaon (District-Khargone)**	18	3%	All Elements from Sl. No. 14(i) to 14(ii).
i	Construction of 132/33kV substation at Pipalgaon			
ii	Kasrawad - Pipalgaon 132kV DCDS line			
15	**132/33kV substation at Ambaja (District-Alirajpur)**	18	4%	All Elements from Sl. No.

S. No	Name of the Transmission Element	Scheduled COD in months from Effective Date	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project	Element(s) which are pre-required for declaring the commercial operation (COD) of the respective Element
i	Construction of 132/33kV substation at Ambaja			15(i) to 15(ii).
ii	LILO of Barwani – Kukshi 132kV line at Ambaja 132kV S/s			
16	**132/33kV substation at ChoubaraDheera (District-Dewas)**	18	3%	All Elements from Sl. No. 16(i) to 16(ii).
i	Construction of 132/33kV substation at ChoubaraDheera			
ii	Sonkatch-ChoubaraDheera 132kV DCSS line			
17	**132/33kV GIS substation at Pithampur Sector-III (District-Dhar)**	24	5%	All Elements from Sl. No. 17(i) to 17(ii).
i	Construction of 132/33kV GIS substation at Pithampur Sector-III			
ii	Pithampur220-Pithampur Sector-III 132kV DCDS line			
18	**System Strengthening Works**	18	1%	
i	Bahadurpur - Badgaon 132kV DCSS line			

The payment of Transmission Charges for any Element, irrespective of its successful commissioning on or before its Scheduled COD, shall only be considered after successful commissioning of the Element(s), which are pre-required for declaring the commercial operation of such Element as mentioned in the above table.

Scheduled COD for the Project is: **24 months from the Effective Date**

Schedule: 3

Safety Rules and Procedures

[Note: As referred to in Articles 5.6 of this Agreement]

1: **Site Regulations and Safety:**

The TSP shall establish Site regulations within sixty (60) days from fulfilment of conditions subsequent, as per Prudent Utility Practices setting out the rules to be observed till expiry of the Agreement at the Site and shall comply therewith.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Project, gate control, sanitation, medical care, and fire prevention, public health, environment protection, security of public life, etc.

Copies of such Site regulations shall be provided to the Long Term Transmission Customer and the STU for the purpose of monitoring of the Project.

2: **Emergency Work:**

In cases of any emergency, the TSP shall carry out all necessary remedial work as may be necessary.

If the work done or caused to be done by any entity , other than the TSP, the TSP shall, reimburse the actual costs incurred, to the other Party carrying out such remedial works.

3: **Site Clearance:**

In the course of execution of the Agreement, the TSP shall keep the Site reasonably free from all unnecessary obstruction, storage, remove any surplus materials, clear away any wreckage, rubbish and temporary works from the Site, and remove any equipment no longer required for execution of the Agreement. After completion of all Elements of the Project, the TSP shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site clean and safe.

4: **Watching and Lighting:**

The TSP shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper construction, operation, maintenance / repair of any of the Elements of the Project, or for the safety of the owners and occupiers of adjacent property and for the safety of the public, during such maintenance / repair.

Schedule: 4

Computation of Transmission Charges

1.1 General

The Monthly Transmission Charges to be paid to the TSP for providing Transmission Service for any Contract Year during the term of the Agreement shall be computed in accordance with this Schedule and paid as per provisions of this Agreement.

Illustration regarding payment of Transmission Charges under various scenarios (considering definitions of Contract Year, Expiry Date & Monthly Transmission Charges above) is as below: -

Illustration-1: In case the Project Elements achieve COD as per Schedule

Quoted Transmission Charges: **Rs. 140 Million**

Completion Schedule:

Element No.	Completion Schedule in Months	Scheduled CoD of the Element	Actual CoD of the Element	% Charges recoverable on Scheduled CoD of the Element
Element 1	28	1-Feb-2018	1-Feb-2018	25%
Element 2	38	1-Dec-2018	1-Dec-2018	75%

Tariff Payable as follows:

Transmission Charges for Element 1			**Transmission Charges for Element 2**		
1-Feb-18 to 31-Mar-18	140 X 25% X ((28+31)/365)	5.65		--	0.00
1-Apr-18 to 30-Nov-18	140 X 25% X (244/365)	23.39		--	0.00
1-Dec-18 to 31-Mar-19	140 X 100% X (121/365)				46.41
2	140 X 100% X 1				140
3	140 X 100% X 1				140
4	140 X 100% X 1				140
5	140 X 100% X 1				140
…….					
…….					
36 (1-Apr to 30-Nov)	140 X 100% X (244/365)				93.59

Illustration-2: In case of extension of Scheduled COD as per Article 4.4.1 & 4.4.2 of this Agreement

Quoted Transmission Charges: **Rs. 140 Million**

Completion Schedule:

Element No.	Completion Schedule in Months	Scheduled CoD of the Element	Actual CoD of the Element	% Charges recoverable on Scheduled CoD of the Element
Element 1	20	1-Feb-2018	1-Jul-2018	25%
Element 2	28	1-Oct-2018	1-Dec-2018	75%

Tariff Payable as follows:

Transmission Charges for Element 1			**Transmission Charges for Element 2**		
1-Feb-18 to 31-Mar-18	--	0.00		--	0.00
1-Apr-18 to 30-Jun-18	--	0.00		--	0.00
1-Jul-18 to 30-Nov-18	140 X 25% X (153/365)	14.67		--	0.00
1-Dec-18 to 31-Mar-19	140 X 100% X (121/365)				46.41
2	140 X 100% X 1				140
3	140 X 100% X 1				140
4	140 X 100% X 1				140
5	140 X 100% X 1				140
…….					
……..					
36 (1-Apr to 30-Nov)	140 X 100% X (244/365)				93.59

Illustration-3: In case of delay in achieving COD of Project & all individual Elements (COD of the Project achieved in Contract Year 1)

Quoted Transmission Charges: **Rs. 140 Million**

Completion Schedule:

Element No.	Completion Schedule in Months	Scheduled CoD of the Element	Actual CoD of the Element	% Charges recoverable on Scheduled CoD

				of the Element
Element 1	20	1-Feb-2018	1-Dec-2018	25%
Element 2	28	1-Oct-2018	1-Dec-2018	75%

Tariff Payable as follows:

Transmission Charges for Element 1			**Transmission Charges for Element 2**		
1-Feb-18 to 31-Mar-18	--	0.00		--	0.00
1-Apr-18 to 30-Sept-18	--	0.00		--	0.00
1-Oct-18 to 30-Nov-18	--	0.00	1-Oct-18 to 30-Nov-18	--	0.00
1-Dec-18 to 31-Mar-19	140 X 100% X (121/365)				46.41
2	140 X 100% X 1				140
3	140 X 100% X 1				140
4	140 X 100% X 1				140
5	140 X 100% X 1				140
…….					
……..					
36 (1-Apr to 30-Nov)	140 X 100% X (244/365)				93.59

Illustration-4: In case of delay in achieving COD of Project & all individual Elements (COD of the Project achieved in Contract Year other than Contact Year 1)

Quoted Transmission Charges: **Rs. 140 Million**

Completion Schedule:

Element No.	Completion Schedule in Months	Scheduled CoD of the Element	Actual CoD of the Element	% Charges recoverable on Scheduled CoD of the Element
Element 1	38	1-Oct-2019	1-May-2020	25%
Element 2	38	1-Oct-2019	1-May-2020	75%

Tariff Payment to be paid as:

Transmission Charges for Element 1			**Transmission Charges for Element 2**		
1-Oct-19 to 31-Mar-20	--	0.00	1-Oct-19 to 31-Mar-20	--	0.00
1-Apr-20 to 30-Apr-20	-	0.00	1-Apr-20 to 30-Apr-20	-	0.00
1-May-20 to 31-Mar-21	140 X 100% X (335/365)				128.49
2	140 X 100% X 1				140
3	140 X 100% X 1				140
4	140 X 100% X 1				140
5	140 X 100% X 1				140
…….					
……..					
36 (1-Apr to 30-Apr)	140 X 100% X (30/ 365)				11.51

Illustration5: In case of delay in achieving COD of Element but Project COD achieved on time

Quoted Transmission Charges: **Rs. 140 Million**

Completion Schedule:

Element No.	Completion Schedule in Months	Scheduled CoD of the Element	Actual CoD of the Element	% Charges recoverable on Scheduled CoD of the Element
Element 1	20	1-Feb-2018	1-Jul-2018	25%
Element 2	30	1-Dec-2018	1-Dec-2018	75%

Tariff Payable as follows:

Transmission Charges for Element 1			Transmission Charges for Element 2		
1-Feb-18 to 31-Mar-18	--	0.00		--	0.00
1-Apr-18 to 30-Jun-18	--	0.00		--	0.00
1-Jul-18 to 30-Nov-18	140 X 25% X (153/365)	14.67		--	0.00
1-Dec-18 to 31-Mar-19	140 X 100% X (121/365)				46.41
2	140 X 100% X 1				140
3	140 X 100% X 1				140
4	140 X 100% X 1				140
5	140 X 100% X 1				140
…….					
……..					
36 (1-Apr to 30-Nov)	140 X 100% X (244/365)				93.59

Illustration-6: In case of early commissioning of Project

Quoted Transmission Charges: **Rs. 140 Million**

Completion Schedule:

Element No.	Completion Schedule in Months	Scheduled CoD of the Element	Actual CoD of the Element	% Charges recoverable on Scheduled CoD of the Element
Element 1	38	1-Oct-2019	1-Jul-2019	25%
Element 2	38	1-Oct-2019	1-Jul-2019	75%

Tariff Payment to be paid as:

Transmission Charges for Element 1	**Transmission Charges for Element 2**	
1-July-19 to 31-Mar-20	140 X 100% X (274/365)	105.09
2	140 X 100% X 1	140
3	140 X 100% X 1	140
4	140 X 100% X 1	140
5	140 X 100% X 1	140
…….		
……..		
36 (1-Apr to 30-Jun)	140 X 100% X (91/365)	34.91

Illustration-7: In case of early commissioning of an element

Quoted Transmission Charges: **Rs. 140 Million**
Completion Schedule:

Element No.	Completion Schedule in Months	Scheduled CoD of the Element	Actual CoD of the Element	% Charges recoverable on Scheduled CoD of the Element
Element 1	38	1-Oct-2019	1-Apr-2019	25%
Element 2	38	1-Jul-2019	1-Jul-2019	75%

Tariff Payment to be paid as:

Transmission Charges for Element 1			Transmission Charges for Element 2		
1-Apr-2019 to 30-Jun-19	140 X 25% X (91/365)	8.72	1-Apr-2019 to 30-Jun-19	--	0.00
1-July-19 to 31-Mar-20	140 X 100% X (274/ 365)				105.09
2	140 X 100% X 1				140
3	140 X 100% X 1				140
4	140 X 100% X 1				140
5	140 X 100% X 1				140
…….					
……..					
36 (1-Apr-30-Jun)	140 X 100% X (91/365)				34.91

The Transmission Charges shall be payable on monthly basis as computed above.

1.2 Computation of Monthly Transmission Charges

The Monthly Transmission Charges for any month m in a Contract Year n shall be calculated as below:

For AC System:

a. If Actual Transmission System Availability for the month m of contract year n is greater than or equal to 98% and less than or equal to 98.5%;

Monthly Transmission Charges MTC(m) = Tmn *1

a. If Actual Transmission System Availability for the month m of contract year n exceeds 98.5% and less than or equal to 99.75%;

Monthly Transmission Charges MTC(m) = Tmn * (AA/ 98.5%)

c. If Actual Transmission System Availability for the month m of contract year n is greater than 99.75%;

Monthly Transmission Charges MTC(m) = Tmn * (99.75% / 98.5%)

d. If Actual Transmission System Availability for the month m of contract year n is less than 98%and greater than or equal to 95.00%;

Monthly Transmission Charges MTC(m) = Tmn * (AA/ 98%)

e. If Actual Transmission System Availability for the month m of contract year falls below 95%;

Monthly Transmission Charges MTC(m) = Tmn * (AA/ 98%) - 0.02 * (Tmn * (AA/ 95%)

For DC System:

a. If Actual Transmission System Availability for the month m of contract year n is greater than or equal to 95% and less than or equal to 96%;

   Monthly Transmission Charges MTC(m) = Tmn *1

b. If Actual Transmission System Availability for the month m of contract year n exceeds 96% and less than or equal to 99.75%;

   Monthly Transmission Charges MTC(m) = Tmn * (AA/ 96%)

c. If Actual Transmission System Availability for the month m of contract year n is greater than 99.75%;

   Monthly Transmission Charges MTC(m) = Tmn * (99.75% / 96%)

d. If Actual Transmission System Availability for the month m of contract year n is less than 95% and greater than or equal to 92.00%;

   Monthly Transmission Charges MTC(m) = Tmn * (AA/ 95%)

e. If Actual Transmission System Availability for the month m of contract year falls below 92%;

   Monthly Transmission Charges MTC(m) = Tmn * (AA/ 95%) - 0.02 * (Tmn * (AA/ 92%)

where:

- AA is the actual Availability, as certified by RPC/ SLDC, as per procedure provided in Schedule 6.
- m is the month in Contract Year ‘n’
- Tmn= Transmission Charges for the month ‘m’ in Contract Year ‘n’ = (=Transmission Charge/ no. of days in the Year n)* no. of days in month m

Provided, no Transmission Charges shall be paid during the period for which the RLDC/ SLDC has not allowed the operation of the Element/Project due to the failure of the TSP to operate it as per the provisions of the Grid Code.

1.3 RLDC/ SLDC Fee & Charges

The payment of RLDC/ SLDC fee & charges, in accordance with relevant regulations of Central Commission/ State Commission, shall be the responsibility of the TSP.

Schedule: 5

Quoted Transmission Charges

[Quoted Transmission Charges from Annexure - 21 of the RFP of the Selected Bidder to be inserted here]

[To be incorporated from the Bid of the Selected Bidder submitted during the e-reverse auction after its selection]

Quoted Transmission Charges: Rs. …… Million

.**Proportionate Transmission Charges payable for each Element of the Project:**

S. No	Name of the Transmission Element	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project
1	**400/220/132/33kV GIS Substation at Mandideep (District-Raisen)**	30%
i	Construction of 400/220kV GIS substation at GIS Mandideep	
ii	LILO of both circuit of Itarsi (PGCIL) - Bhopal 400kV line (on Twin Moose) at MandideepGIS400kV S/s	
iii	LILO of both circuits of Hoshangabad - Mandideep - Adampur 220kV line at Mandideep GIS 400kV S/s c. LILO of Hosangabad – Adampur 220kV line at Mandideep GIS 400 kV S/s. d. LILO of Mandideep – Bhopal 220kV line at Mandideep GIS 400 kV S/s.	
iv	LILO of Mandideep132 - Bagroda 132kV line at Mandideep GIS 400kV S/s	
v	LILO of Mandideep220 - MACT Bhopal 132kV line at MandideepGIS400kV S/s	
2	**220/132/33kV substation at Bisonikala (District-Hoshangabad)**	6%
i	Construction of 220/132/33kV substation at Bisonikala	
ii	LILO of both circuits of Satpura-Itarsi-Handiya 220kV line	

S. No	Name of the Transmission Element	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project
	at Bisonikala 220kV S/s	
iii	LILO of SeoniMalwa-Harda 132kV S/c line at Bisonikala 220kV S/s	
3	**220/132/33kV Substation at Khargone (District-Khargone)**	10%
i	Construction of 220/132kV substation at Khargone	
ii	LILO of both circuits of Chhegaon - Nimrani 220kV line at Khargone 220kV S/s	
iii	LILO of Khargone - Julwaniya(Talakpura) 132kV line at Khargone 220kV S/s	
iv	LILO of Bhikangaon - Bistan 132kV line at Khargone 220kV S/s	
4	**132/33kV substation at Sodalpur(District-Harda)**	3%
i	Construction of 132/33kV substation at Sodalpur	
ii	Bisonikala – Sodallpur-Sultanpur 132kV DCSS line.	
5	**132/33kV substation at Jawarjod (District-Sehore)**	2%
i	Construction of 132/33kV substation at Jawarjod	
ii	LILO of Ashta - Sonkatch 132kV S/C line at Jawarjod 132kV S/s	
6	**132/33kV substation at Pathari (District-Raisen)**	3%
i	Construction of 132/33kV substation at Pathari	
ii	Gairatganj-Pathari 132kV DCDS line	
7	**132/33kV substation at Badi (District-Raisen)**	4%
i	Construction of one No. 132/33kV substation at Badi	

S. No	Name of the Transmission Element	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project
ii	Bareli-Badi-Shahganj 132kV DCSS line	
8	**132/33kV substation at Semrahat (District-Guna)**	4%
i	Construction of 132/33kV substation at Semrahat	
ii	Ashoknagar-Semrahat-Aron 132kV DCSS line	
9	**132/33kV GIS substation at HOD Bhopal (District-Bhopal)**	10%
i	Construction of 132/33kV GIS Substation at HOD Bhopal	
ii	MugaliyaChhap-HOD Bhopal 132kV DCDS line (with Monopole Towers)	
10	**220/33kV substation at Shahpur (District-Betul)**	4%
i	Construction of 220/33kV substation at Shahpur	
ii	LILO one circuit of Satpura TPS-Itarsi 220 kV line at Shahpur 220/33kV S/s	
11	**132/33kV substation at Chhapiheda (District-Rajgarh)**	3%
i	Construction of 132/33kV substation at Chhapiheda	
ii	Khujner-Chhapiheda-Nalkheda 132kV DCSS line	
12	**132/33kV substation Bhatpachlana (District-Ujjain)**	3%
i	Construction of 132/33kV substation Bhatpachlana	
ii	LILO of Badnagar-Orange Berchha 132kV DCSS line at Bhatpachlana132kV S/s (on Multi Circuit tower or separate double circuit towers)	
13	**132/33kV substation at Dhodhar (District-Ratlam)**	2%
i	Construction of 132/33kV substation at Dhodhar	
ii	LILO of Jaora -Daloda 132kV line at Dhodhar 132kV S/s	

S. No	Name of the Transmission Element	Percentage of Quoted Transmission Charges recoverable on Scheduled COD of the Element of the Project
14	**132/33kV substation at Pipalgaon (District-Khargone)**	3%
i	Construction of 132/33kV substation at Pipalgaon	
ii	Kasrawad - Pipalgaon 132kV DCDS line	
15	**132/33kV substation at Ambaja (District-Alirajpur)**	4%
i	Construction of 132/33kV substation at Ambaja	
ii	LILO of Barwani – Kukshi 132kV line at Ambaja 132kV S/s	
16	**132/33kV substation at ChoubaraDheera (District-Dewas)**	3%
i	Construction of 132/33kV substation at ChoubaraDheera	
ii	Sonkatch-ChoubaraDheera 132kV DCSS line	
17	**132/33kV GIS substation at Pithampur Sector-III (District-Dhar)**	5%
i	Construction of 132/33kV GIS substation at Pithampur Sector-III	
ii	Pithampur220-Pithampur Sector-III 132kV DCDS line	
18	**System Strengthening Works**	1%
i	Bahadurpur - Badgaon 132kV DCSS line	

Schedule: 6

Appendix-II

Procedure for Calculation of Transmission System Availability Factor for a Month

1. Transmission system availability factor for n^{th} calendar month ("TAFPn") shall be calculated by the respective transmission licensee, got verified by the concerned Regional Load Dispatch Centre (RLDC) and certified by the Member-Secretary, Regional Power Committee (RPC) of the region concerned, separately for each AC and HVDC transmission system and grouped according to sharing of transmission charges. In case of AC system, transmission System Availability shall be calculated separately for each Regional Transmission System and inter-regional transmission system. In case of HVDC system, transmission System Availability shall be calculated on consolidated basis for all inter-state HVDC system.

2. Transmission system availability factor for n^{th} calendar month ("TAFPn") shall be calculated by considering the following:

i) **AC transmission lines:** Each circuit of AC transmission line shall be considered as one element;

ii) **Inter-Connecting Transformers (ICTs):** Each ICT bank (three single phase transformer together) shall form one element;

iii) **Static VAR Compensator (SVC):** SVC along with SVC transformer shall form one element;

iv) **Bus Reactors or Switchable line reactors**: Each Bus Reactors or Switchable line reactors shall be considered as one element;

v) **HVDC Bi-pole links:** Each pole of HVDC link along with associated equipment at both ends shall be considered as one element;

vi) **HVDC back-to-back station:** Each block of HVDC back-to-back station shall be considered as one element. If associated AC line (necessary for transfer of inter-regional power through HVDC back-to-back station) is not available, the HVDC back-to-back station block shall also be considered as unavailable;

vii) **Static Synchronous Compensation ("STATCOM"):** Each STATCOM shall be considered as separate element.

3. The Availability of AC and HVDC portion of Transmission system shall be calculated by considering each category of transmission elements as under:

TAFMn (in %) for AC system:

$$= \frac{o \text{ X } AVo)+(p \text{ X } AVp) + (q \text{ X } AVq) + (r \text{ X } AVr)+(u \text{ X } AVu)}{(o + p + q + r+u)} \times 100$$

Where,

o	=	Total number of AC lines.
AVo	=	Availability of o number of AC lines.
p	=	Total number of bus reactors/switchable line reactors
AVp	=	Availability of p number of bus reactors/switchable line reactors
q	=	Total number of ICTs.
AVq	=	Availability of q number of ICTs.
r	=	Total number of SVCs.
AVr	=	Availability of r number of SVCs
u	=	Total number of STATCOM.
AVu	=	Availability of u number of STATCOMs

TAFMn (in %) for HVDC System:

$$= \frac{\sum_{x=1}^{s} Cxbp(act) \text{ X } AVxbp + \sum_{y=1}^{t} Cy(act)btb \text{ X } AVybtb}{\sum_{x=1}^{s} Cxbp + \sum_{y=1}^{t} Cybtb} \times 100$$

Where

Cxbp(act)	=	Total actual operated capacity of x^{th} HVDC pole
Cxbp	=	Total rated capacity of x^{th} HVDC pole
AVxbp	=	Availability of x^{th} HVDC pole
Cybtb(act)	=	Total actual operated capacity of y^{th} HVDC back-to-back station Block
AVybtb	=	Availability of y^{th} HVDC back-to-back station block
S	=	Total no of HVDC poles
T	=	Total no of HVDC Back to Back blocks

4. The availability for each category of transmission elements shall be calculated based on the weightage factor, total hours under consideration and non-available hours for each element of that category.

The formulae for calculation of Availability of each category of the transmission elements are as per **Appendix-III**. The weightage factor for each category of transmission elements shall be considered asunder:

i) For each circuit of AC line – Number of sub-conductors in the line multiplied by ckt-km;

ii) For each HVDC pole- The rated MW capacity x ckt-km;

iii) For each ICT bank – The rated MVA capacity;

iv) For SVC- The rated MVAR capacity (inductive and capacitive);

v) For Bus Reactor/switchable line reactors – The rated MVAR capacity;

vi) For HVDC back-to-back station connecting two Regional grids- Rated MW capacity of each block; and

vii) For STATCOM – Total rated MVAR Capacity.

5. The transmission elements under outage due to following reasons shall be deemed to be available:

i. Shut down availed for maintenance of another transmission scheme or construction of new element or renovation/upgradation/additional capitalization in existing system approved by the Commission. If the other transmission scheme belongs to the transmission licensee, the Member-Secretary, RPC may restrict the deemed availability period to that considered reasonable by him for the work involved. In case of dispute regarding deemed availability, the matter may be referred to Chairperson, CEA within 30 days.

ii. Switching off of a transmission line to restrict over voltage and manual tripping of switched reactors as per the directions of concerned RLDC.

6. For the following contingencies, outage period of transmission elements, as certified by the Member Secretary, RPC, shall be excluded from the total time of the element under period of consideration for the following contingencies:

i) Outage of elements due to acts of God and force majeure events beyond the control of the transmission licensee. However, whether the same outage is due to force majeure (not design failure) will be verified by the Member Secretary, RPC.A reasonable restoration time for the element shall be considered by Member Secretary, RPC and any additional time taken by the transmission licensee for restoration of the element beyond the reasonable time shall be treated as outage time attributable to the transmission licensee. Member Secretary, RPC may consult the transmission licensee or any expert for estimation of reasonable restoration time. Circuits restored through ERS (Emergency Restoration System) shall be considered as available;

ii) Outage caused by grid incident/disturbance not attributable to the transmission licensee, e.g. faults in substation or bays owned by other agency causing outage of the transmission licensee's elements, and tripping of lines, ICTs, HVDC, etc. due to grid disturbance. However, if the element is not restored on receipt of direction from RLDC while normalizing the system following grid incident/disturbance within reasonable time, the element will be considered not available for the period of outage after issuance of RLDC's direction for restoration:

Provided that in case of any disagreement with the transmission licensee regarding reason for outage, same may be referred to Chairperson, CEA within 30 days. The above need to be resolved within two months:

Provided further that where there is a difficulty or delay beyond sixty days, from the incidence in finalizing the recommendation, the Member Secretary of concerned RPC shall allow the outage hours on provisional basis till the final view.

7. **Time frame for certification of transmission system availability:**

(1) Following schedule shall be followed for certification of availability by Member Secretary of concerned RPC:

- Submission of outage data by Transmission Licensees to RLDC/ constituents – By 5th of the following month;
- Review of the outage data by RLDC / constituents and forward the same to respective RPC – by 20th of the month;
- Issue of availability certificate by respective RPC – by 3rd of the next month.

Appendix-III

FORMULAE FOR CALCULATION OF AVAILABILITY OF EACH CATEGORY OF TRANSMISSION ELEMENTS

For AC transmission system

AVo(Availability of o no. of AC lines) = $\frac{\sum_{i=1}^{o} Wi(Ti - TNAi)/Ti}{\sum_{i=1}^{o} Wi}$

AVq(Availability of q no. of ICTs) = $\frac{\sum_{k=1}^{q} Wk(Tk - TNAk)/Tk}{\sum_{k=1}^{q} Wk}$

AVr(Availability of r no. of SVCs) = $\frac{\sum_{l=1}^{r} Wl(Tl - TNAl)/Tl}{\sum_{l=1}^{r} Wl}$

AVp(Availability of p no. of Switched Bus reactors) = $\frac{\sum_{m=1}^{p} Wm(Tm - TNAm)/Tm}{\sum_{m=1}^{p} Wm}$

AVu(Availability of u no. of STATCOMs) = $\frac{\sum_{n=1}^{u} Wn(Tn - TNAn)/Tn}{\sum_{n=1}^{u} Wn}$

AV_{xbp}(Availability of an individual HVDC pole) = $\frac{(Tx - TNAx)}{Tx}$

AV_{ybtb} (Availability of an individual HVDC Back-to-back Blocks) = $\frac{(Ty - TNAy)}{Ty}$

For HVDC transmission system

For the new HVDC commissioned but not completed twelve months;

For first 12 months: [(AV_{xbp} or AV_{ybtb})x95%/85%], subject to ceiling of 95%.

Where,

o	=	Total number of AC lines;
AVo	=	Availability of o number of AC lines;
p	=	Total number of bus reactors/switchable line reactors;
AVp	=	Availability of p number of bus reactors/switchable line reactors;
q	=	Total number of ICTs;
AVq	=	Availability of q number of ICTs;
r	=	Total number of SVCs;
AVr	=	Availability of r number of SVCs;
AVu	=	Availability of u number of STATCOMs;

W*i*	=	Weightage factor for *i*th transmission line;
W*k*	=	Weightage factor for *k*th ICT;
W*l*	=	Weightage factors for inductive & capacitive operation of *l*th SVC;
Wm	=	Weightage factor for mth bus reactor;
Wn	=	Weightage factor for nth STATCOM.

T*i*, , T*k*, T*l*, T*m*, T*n*, *Tx*, *Ty* -The total hours of i^{th} AC line, k^{th} ICT, l^{th} SVC, m^{th} Switched Bus& n^{th} STATCOM, x^{th} HVDC pole, y^{th} HVDC back-to-back blocks during the period under consideration (excluding time period for outages not attributable to transmission licensee for reasons given in Para 5 of the procedure)

$T_{NA}i$, $T_{NA}k$, $T_{NA}l$, $T_{NA}m$, $T_{NA}n$, T_{NAx}, $T_{NA}y$ -The non-availability hours (excluding the time period for outages not attributable to transmission licensee. taken as deemed availability as for i^{th} AC line, k^{th} ICT, l^{th} SVC , m^{th} Switched Bus Reactor, n^{th} STATCOM, x^{th} HVDC pole and y^{th} HVDC back-to-back block

Schedule: 7

Entire Bid (both financial bid and technical bid) of the Selected Bidder to be attached here

Schedule: 8

Contract Performance Guarantee

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution. Foreign entities submitting Bids are required to follow the applicable law in their country.)

In consideration of the ……..[Insert name of the SPV or Selected Bidder on behalf of the TSP, or Lead Member in case of the Consortium, with address] agreeing to undertake the obligations under the Transmission Service Agreement dated …….and the other RFP Project Documents and the Long Term Transmission Customer and the ……..[Insert the name of the BPC], agreeing to execute the *RFP Project Documents* with the Selected Bidder, regarding setting up the Project, the …… [Insert name and address of the bank issuing the guarantee and address of the head office] (hereinafter referred to as "Guarantor Bank") hereby agrees unequivocally, irrevocably and unconditionally to pay to …… (being the Long Term Transmission Customer) at ……[Insert the Place from the address of the Long Term Transmission Customer indicated in the TSA] forthwith on demand in writing from the Long Term Transmission Customer or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees …….. Crores (Rs. …….) only [Insert the amount of the bank guarantee] on behalf of M/s. ……. [Insert name of the Selected Bidder or SPV].

This guarantee shall be valid and binding on the Guarantor Bank up to and including ……and shall not be terminable by notice or any change in the constitution of the Bank or the term of the Transmission Service Agreement or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs. …….. Crores (Rs. ……..) only. Our Guarantee shall remain in force until …….. [Insert the date of validity of the Guarantee as per Article 3.1.2 of this Agreement]. The Long Term Transmission Customer, shall be entitled to invoke this Guarantee up to three hundred sixty five (365) days of the last date of the validity of this Guarantee.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand from …… (in its roles as the Long Term Transmission Customer), made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to Long Term Transmission Customer.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by ..... [Insert name of the Selected Bidder], …….. [Insert name of the TSP] and / or any other person. The Guarantor Bank shall not require Long Term Transmission Customer to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against Long Term Transmission Customer in respect of any payment made hereunder.

THIS BANK GUARANTEE shall be interpreted in accordance with the laws of India.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

THIS BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring, liquidation, winding up, dissolution or any other change in the constitution of the Guarantor Bank.

THIS BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly Long Term Transmission Customer shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against …… [Insert name of the SPV] or the Selected Bidder, as the case may be, to make any claim against or any demand on …… [Insert name of the SPV] or the Selected Bidder, as the case may be, or to give any notice to …… [Insert name of the SPV] or the Selected Bidder, as the case may be, or to enforce any security held by the Long Term Transmission Customer or to exercise, levy or enforce any distress, diligence or other process against …… [Insert name of the SPV] or the Selected Bidder, as the case may be.

The Guarantor Bank acknowledges that this BANK GUARANTEE is not personal to Long Term Transmission Customer and may be assigned, in whole or in part, (whether absolutely or by way of security) by Long Term Transmission Customer to any entity to whom the Long Term Transmission Customer is entitled to assign its rights and obligations under the Transmission Service Agreement.

The Guarantor Bank hereby agrees and acknowledges that Long Term Transmission Customer shall have a right to invoke this Bank Guarantee either in part or in full, as it may deem fit.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs. …….. Crores (Rs. ……..) only and it shall remain in force until ……[Date to be inserted on the basis of Article 3.1.2of the Transmission Service Agreement], with an additional claim period of three hundred sixty five (365) days thereafter. This BANK GUARANTEE shall be extended from time to time for such period, as may be desired by …….. [Insert name of the Selected Bidder or Lead Member in case of the Consortium or SPV]. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if Long Term Transmission Customer serves upon us a written claim or demand.

In witness where of:

Signature .....

Name: .....

Power of attorney No.: ……

For:

…….. [Insert Name of the Bank]

Banker's Seal and Full Address, including mailing address of the Head Office

Schedule: 9

Methodology for determining the Relief Under Force Majeure Event & Change in Law during Construction Period

The relief in the form of revision in tariff due to Force Majeure Event leading to extension of Scheduled COD for a period beyond one hundred eighty (180) days and/ or Change in Law during the construction period shall be as under:

$\Delta T = [(P \times d)] \div [1-(1+ d)^{(-n)}]$

Where,

ΔT = Change in Transmission Charges for each year

P = Sum of cumulative increase or decrease in the cost of the Project due to Change in Law and interest cost during construction corresponding to the period exceeding one hundred eighty (180) due to Force Majeure Event leading to extension of Scheduled COD for a period beyond one hundred eighty (180) days

n = number of years over which the Transmission Charges has to be paid

d = Discount rate as notified by the CERC, applicable on the Bid Deadline

The increase in Transmission Charges as stated above shall be applicable only if the value of increase in Transmission Charges as calculated above exceeds 0.30% (zero point three percent) of the quoted Transmission Charges of the TSP.

Schedule:10

List of Long Term Transmission Customer

Note: As referred in the recital of this Agreement and in the definition of "Long Term Transmission Customer" in this Agreement

Sl. No.	Name of the Long Term Transmission Customer	Address of Registered Office	Law under which incorporated	Allocated Project Capacity (in MW)
1.	M.P. Power Management Company Limited (MPPMCL) on behalf of: i. MP Poorv Kshetra Vidyut Vitran Compant Limited, Jabalpur ii. MP Madhya Kshetra Vidyut Vitran Compant Limited, Bhopal iii. MP Paschim Kshetra Vidyut Vitran Compant Limited, Indore	Shakti Bhavan, MPSEB Colony, Rampur, Jabalpur, Madhya Pradesh 482008	Companies Act, 2013	100%

Note: The above list of Long Term Transmission Customer subject to change. Any addition or deletion in this list after the award of LoI shall be duly notified to the parties to the Agreement.

The new Long Term Transmission Customer shall become a party to the TSA after agreeing to the terms and conditions of this Agreement and signing a Supplemental Agreement as annexed in Schedule 11 to this Agreement.

Schedule: 11

SUPPLEMENTARY AGREEMENT

BETWEEN

…….……. [Insert name of the TSP]

AND

…… [Insert name of the new Long Term Transmission Customer 1],

……. [Insert name of the new Long Term Transmission Customer 2],

.
.
.

…… [Insert name of the new Long Term Transmission Customer n]

THIS SUPPLEMENTARY AGREEMENT entered into on ……. [Insert date] …… [Insert day] of ……[Insert month] in …… [Insert year] by and between, …….. [Insert name of the Transmission Service Provider] incorporated under the Companies Act, 1956, having its registered office at …….. (here in after referred to as Transmission Service Provider or "TSP", which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as Party of the first part,

AND

……. [Insert name of the new Long Term Transmission Customer '1'] having its registered office at……. [Insert address of the new Long Term Transmission Customer 1] and having an Allocated Project Capacity as specified in the Table 2 of this Supplementary Agreement, (which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as Party of the second part,

……. [Insert name of the new Long Term Transmission Customer '2'] having its registered office at……. [Insert address of the new Long Term Transmission Customer 1] and having an Allocated Project Capacity as specified in the Table 2 of this Supplementary Agreement, (which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as Party of the third part,

.
.
.

……. [Insert name of the new Long Term Transmission Customer 'n'] having its registered office at……. [Insert address of the new Long Term Transmission Customer 1] and having an Allocated Project Capacity as specified in the Table 2 of this Supplementary Agreement, (which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as Party of the nth part.

WHEREAS:

A. The TSP has executed the TSA with the existing Long Term Transmission Customer as listed out in Schedule 10 of the TSA.

B. The existing Long Term Transmission Customer as listed out in Schedule 10 of the TSA have executed the TSA with the TSP.

C. The TSP has agreed to provide the Transmission Service to the existing Long Term Transmission Customer as per the terms and conditions of the TSA.

D. The Allocated Project Capacity of the existing Long Term Transmission Customer as on this date……[Insert date] is as detailed below:

Table : 1

Sl. No.	**Name of the existing Long Term Transmission Customer**	**Allocated Project Capacity (in MW)**
1		
2		
3		
.		
.		

E. The existing Long Term Transmission Customer have agreed, on the terms and subject to the conditions of the TSA, to use the available transmission capacity of the Project and pay TSP the Transmission Charges as determined in accordance with the terms of the TSA.

NOW THEREFORE THIS AGREEMENT WITNESSETH as under:

1) The new Long Term Transmission Customer and their Allocated Project Capacity as on this date…. [Insert date] are as detailed below:

Table 2:

Sl. No.	**Name of the new Long Term Transmission Customer**	**Allocated Project Capacity (in MW)**
1		
2		
3		
.		
.		

2) The new Long Term Transmission Customer have been granted long term open access from the CTU/STU, as the case may be, and are beneficiaries to the Project.

3) The new Long Term Transmission Customer agree to the terms and conditions laid down in the TSA, to use the Project and pay the TSP the Transmission Charges as determined in accordance with the terms of the TSA and the provisions of this Supplementary Agreement.

4) The TSP agrees to provide the Transmission Service to the new Long Term Transmission Customer as per the terms and conditions of the TSA.

5) All terms and conditions of the TSA between the TSP and the existing Long Term Transmission Customer (as listed out in Table 1 of this Supplementary Agreement) shall apply, mutatis mutandis without any change, to the new Long Term Transmission Customer (as listed out in Table 2 of this Supplementary Agreement)

IN WITNESS WHEREOF the parties have executed these presents through their Authorised Representatives

WITNESS:

Table 3:
WITNESS

1. Signature: Name: …….. Designation: …….	For and on behalf of ……. [Insert name of the TSP]
2. Signature: Name: …….. Designation: …….	For and on behalf of ……. [Insert name of the new Long Term Transmission Customer 1]
3. Signature: Name: …….. Designation: …….	For and on behalf of ……. [Insert name of the new Long Term Transmission Customer 1]
. n. Signature: Name: …….. Designation: …….	; For and on behalf of ……. [Insert name of the new Long Term Transmission Customer n]