**ANNEXURE TTL: TECHNICAL PARAMETERS OF TRANSMISSION LINE & ASSOCIATED BAY**

Name of the Transmission Line Proposed to be Charged:

|  |  |  |  |
| --- | --- | --- | --- |
| **TECHNICAL PARAMETERS OF LINE** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | From Substation | Name |  |
| **2** | To Substation | Name |  |
| **3** | Voltage Level | kV |  |
| **4** | Line Length | km |  |
| **5** | Type of conductor Used |  |  |
| **6** | No of Sub conductors | No |  |
| **7** | Type of Insulator |  |  |
| **8** | Positive Sequence |  |  |
|  | R (Resistance) | ohm/km |  |
|  | X (Reactance) | ohm/km |  |
|  | B (Susceptance) | mho/km |  |
| **9** | Zero Sequence |  |  |
|  | R (Resistance) | ohm/km |  |
|  | X (Reactance) | ohm/km |  |
|  | B (Susceptance) | mho/km |  |
| **10** | Ampacity | A |  |
| **11** | Temperature related Ampacity Values, if | A & Temp |  |
|  | available | A & Temp |  |
|  |  | A & Temp |  |
|  |  | A & Temp |  |
| **12** | Transposition Details |  |  |
|  | No of Transposition Towers in the line | No |  |
|  | Distance of the Transposition Towers from From End | location nos, km |  |
| **13** | Dropper from Line to Bus Details |  |  |
|  | **Sending End Name** | Name |  |
|  | Type of conductor used | Type |  |
|  | No of conductors | No |  |
|  | Capacity | A |  |
|  | **To Substation** | Name |  |
|  | Type of conductor used | Type |  |
|  | No of conductors | No |  |
|  | Capacity | A |  |

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| **TECHNICAL PARAMETERS OF BUS BAR** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Substation Name | Name |  |
| **2** | Voltage Level | kV |  |
| **3** | Rated Capacity of the Bus | A |  |
| **4** | Type of Bus Bar | (Al Pip or conductor etc) |  |
| **5** | Bus Bar Scheme showing the element connected submitted | Yes/No |  |

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| **TECHNICAL PARAMETERS OF SURGE ARRESTOR** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Make |  |  |
| **2** | Rated System Voltage | kV |  |
| **3** | Highest System Voltage | kV |  |
| **4** | Rated Arrester Voltage | kV |  |
| **5** | Continuous Operating Voltage (COV) at 50 deg C | kVrms |  |
| **6** | Minimum Discharge Capability | kJ/kV |  |
| **7** | Discharge Current (8/20 us wave): |  |  |
|  | Nominal Discharge current | kAp |  |
|  | Discharge Current at which insulation co-ordination will be done | kAp |  |

*If the parameters for the three phases differ, please submit the information in multiple formats for different phases. Else, only one copy of this format is sufficient.*

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| **TECHNICAL PARAMETERS OF WAVE TRAP** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Type of Wave Trap | Outdoor/Indoor |  |
| **2** | Type of Wave Trap | Post Insulator/CVT/Suspension Type |  |
| **3** | Voltage Level |  |  |
| **4** | Resistive Component of Impedance | Ohm |  |
| **5** | Tolerable Short Circuit Current | kA |  |
|  | **PLCC** | **-** | **-** |
| **6** | Make |  |  |
| **7** | Model |  |  |
| **8** | No of Panels |  |  |
| **9** | No of Codes |  |  |
| **10** | Availability of Digital Protection Coupler |  |  |
| **11** | Mode of Transmission |  |  |
| **12** | No of Channels |  |  |
| **13** | HF Channel | kHz |  |
| **14** | Normal Continuous Current Rating | A |  |
| **15** | Supply Voltage (DC) | V |  |

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| **TECHNICAL PARAMETERS OF VOLTAGE TRANSFORMER** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Nominal/Rated Voltage | kV |  |
| **2** | Highest System Voltage | kV |  |
| **3** | Fault Current and Duration | kA and sec |  |
| **4** | Cooling Mechanism |  |  |
| **5** | Burden |  |  |
| **6** | No of Cores | No |  |
| **7** | CVT core details **diagram** marking the metering and protection details used. | Whether Submitted **(Yes/No)** |  |
| **8** | Rated Primary Voltage | kV |  |
| **9** | Rated Secondary Voltage | V |  |
| **10** | Accuracy Class |  |  |
|  | :- Protection |  |  |
|  | :- Metering |  |  |
|  | :- Any Other |  |  |
| **11** | Rated Capacitance | pF |  |
| **12** | No of CVTs | Whether in every phase or two or one |  |
| **13** | Rated Voltage Factor |  |  |
|  | :- continuous |  |  |
|  | :- for 30 seconds |  |  |

*If the parameters for the three phases differ, please submit the information in multiple formats for different phases. Else, only one copy of this format is sufficient.*

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| **TECHNICAL PARAMETERS OF CURRENT TRANSFORMER** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Nominal/Rated Voltage | kV |  |
| **2** | Highest System Voltage | kV |  |
| **3** | No of Cores | Nos |  |
| **4** | Cooling Mechanism |  |  |
| **5** | Burden |  |  |
| **6** | Rated Primary Current | A |  |
| **7** | CT core details **diagram** marking the metering and protection details used. | Whether Submitted (Yes/No) |  |
| **8** | Rated Transformation Ratio Used | - | - |
| **9a** | Protection | - | - |
|  | Bus Differential | A |  |
|  | Other Protection Details | A |  |
|  | Other Protection Details | A |  |
|  | Other Protection Details | A |  |
|  | Other Protection Details | A |  |
|  | Other Protection Details | A |  |
| **9b** | Metering | A |  |
| **10** | Rated Fault current & its duration | kA |  |
| **11** | Rated dynamic short circuit current | kAp |  |
| **12** | Available CT Ratio |  |  |
| **13** | Rated CT Ratio |  |  |

*If the parameters for the three phases differ, please submit the information in multiple formats for different phases. Else, only one copy of this format is sufficient.*

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| **TECHNICAL PARAMETERS OF CIRCUIT BREAKER** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Nominal/Rated Voltage | kV |  |
| **2** | Rated Current | A |  |
| **4** | Operating Mechanism | Whether Pneumatic/ Spring/ hydraulic or its combination |  |
| **5** | Quenching Medium |  |  |
| **5** | Rated Fault current & its duration | kA & sec |  |
| **6** | Rated short circuit making current | kAp |  |
| **7** | No of Trip Coils |  |  |
| **8** | No of Sources for Trip Coils |  |  |
| **9** | Rated Operating duty cycle: |  |  |
|  | for auto-reclosing type | Eg: O-0.3 sec- CO- 3 min-CO |  |
|  | for non-auto reclosing type | Eg: O-0.3 sec- CO- 3 min-CO |  |
|  | for non-auto reclosing type (Generator Transformer CB of hydro projects) | Eg: O-0.3 sec- CO- 3 min-CO |  |
| **10** | Auto Reclose | Single Phase/ Three Phase |  |
| **11** | Whether ganged operated or single plase operation |  |  |
| **12** | PIR Details |  |  |

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| **TECHNICAL PARAMETERS OF DISCONNECTOR AND EARTH SWITCHES** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Nominal/Rated Voltage | kV |  |
| **2** | Highest System Voltage | kV |  |
| **3** | Rated Current | A |  |
| **4** | Operating Mechanism | Eg: AC motor operated & manual |  |
| **5** | Rated Fault current & its duration | kA |  |
| **6** | Rated short circuit making current | kAp |  |
| **7** | Operating Time | Sec |  |
| **8** | DC Control Voltage | V |  |

*If the parameters for the three phases differ, please submit the information in multiple formats for different phases. Else, only one copy of this format is sufficient.*

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| **PROTECTION DATA OF TRANSMISSION LINE** | | | |
|  |  |  |  |
| **SN** | **Details** | **Unit** | **Value** |
| **1** | Whether Manual Trigger DR and EL outputs (cfg and dat file) of the numerical relays and of other relays (if download possible) for the element submitted. | Yes/No |  |
| **2** | List of DR Channels and EL Channels configured |  |  |
| **3** | Standalone/In-built in relay |  |  |
| **4** | Standalone/Configured in BCU or SCADA |  |  |
| **5** | Installation of TLSA | Yes/No, If Yes, Location |  |
| **6** | **Line Differential Protection** | - | - |
|  | Available | Yes/No |  |
|  | Make |  |  |
|  | Model |  |  |
| **7** | **Main I Protection** | - | - |
|  | Type | Numerical/ EM/ Static |  |
|  | Make |  |  |
|  | Model |  |  |
|  | Whether DEF enabled | Yes/No |  |
| **8** | **Main II Protection** | - | - |
|  | Type | Numerical/ EM/ Static |  |
|  | Make |  |  |
|  | Model |  |  |
|  | Whether DEF enabled | Yes/No |  |
| **9** | **Over Voltage Stage I** | - | - |
|  | External Relay/Enabled in (Main-I / Main-II) or both Main-I & Main-II |  |  |
|  | Type | Numerical/ EM/ Static |  |
|  | Make |  |  |
|  | Model |  |  |
|  | Settings | Voltage and Time |  |
| **10** | **Over Voltage Stage II** | - | - |
|  | External Relay/Enabled in (Main-I / Main-II) or both Main-I & Main-II |  |  |
|  | Type | Numerical/ EM/ Static |  |
|  | Make |  |  |
|  | Model |  |  |
|  | Settings | Voltage and Time |  |
| **11** | **Direct Trip** | - | - |
|  | Handtrip | (Yes/No) |  |
|  | LBB | (Yes/No) |  |
|  | DEF | (Yes/No) |  |
|  | Reactor protecion | (Yes/No) |  |
|  | Over-voltage | (Yes/No) |  |
|  | Busbar | (Yes/No) |  |
| **12** | **Carrier Aided Trip** | - | - |
|  | Availability | (Yes/No) |  |
|  | POR/PUR |  |  |
| **13** | **Over Current** | **-** | **-** |
|  | Type |  |  |
|  | Model |  |  |
|  | Make |  |  |
|  | TMS |  |  |
|  | PMS |  |  |
|  | Operating Curve Type |  |  |
| **14** | **Earth Fault** | **-** | **-** |
|  | Type |  |  |
|  | Model |  |  |
|  | Make |  |  |
|  | TMS |  |  |
|  | PMS |  |  |
|  | Operating Curve Types |  |  |
| **15** | **Broken Conductor Alarm** | Yes/No |  |
| **16** | **Stub protection** | (Yes/No/NA) |  |
| **17** | **TEED Protection** | (Yes/No) |  |
|  | Type |  |  |
|  | Model |  |  |
|  | Make |  |  |
| **18** | DEF | - | - |
|  | Type |  |  |
|  | Model |  |  |
|  | Make |  |  |
| **19** | LBB | - | - |
|  | Type |  |  |
|  | Model |  |  |
|  | Make |  |  |
|  | Setting |  |  |
| **20** | Check Synchronisation/ Dead Line Charging | Yes /No |  |
| **21** | Time Sync of Relay | Yes/ No |  |
| **22** | Fault Locator |  |  |
| **23** | DR |  |  |
|  | Installed | Yes/ No |  |
|  | Activated | Yes/ No |  |
|  | Standardised | Yes/ No |  |
|  | No of Digital Channels Assigned |  |  |
| **24** | EL |  |  |
|  | Installed | Yes/ No |  |
|  | Activated | Yes/ No |  |
|  | Standardised | Yes/ No |  |
| **25** | Any Other Protection Details |  |  |

**(Name and Designation of the authorized person with official seal)**

**(not below the rank of Assistant General Manager or equivalent)**

**Place: Date:**