Amendment No. 2 dated 21.05.2021

to

Request for Proposal (RfP) and Transmission Service Agreement (TSA) for selection of Transmission Service Provider through tariff based competitive bidding process to establish transmission system for "Establishment of new 220/132kV substation at Nangalbibra"

<table>
<tr><th>S. No.</th><th>Existing Provision</th><th>Amended Provision</th></tr>
<tr><td colspan="3">Request for Proposal (RfP) / Transmission Service Agreement (TSA)</td></tr>
<tr><td>1.</td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation

Clause 2.1 Power Transformer

Clause 2.1.1 220/132kV, 3-phase Autotransformer

Transformer shall conform to IEC 60076 …….

….

HV and IV bushing shall be RIP (Resin Impregnated Paper)/RIS (Resin Impregnated Synthetic) with composite insulator type. LV bushing shall be OIP/RIP/RIS. 36kV Neutral bushing shall be solid porcelain or oil communicating type.

The major technical particulars / parameters of transformer are given below:

<table><tr><th>Sl. No.</th><th>Description</th><th>Unit</th><th>Technical Parameters</th></tr><tr><td>1.</td><td>Voltage ratio (line to line)</td><td>kV</td><td>220/132/33</td></tr><tr><td>2.</td><td>….</td><td>…</td><td>…</td></tr><tr><td>…</td><td>…</td><td>…</td><td>…</td></tr><tr><td>25.</td><td>…</td><td>…</td><td>…</td></tr></table></td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation

Clause 2.1 Power Transformer

Clause 2.1.1 220/132kV, 3-phase Autotransformer

160 MVA, 220/132/33 kV power transformer shall be as per "Standard Specifications and Technical Parameters for Transformers and Reactors (66 kV and above)" available on CEA website shall be followed.

The major technical particulars / parameters of transformer are given below:

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<tr><td>2.</td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation

Clause 2.2 Shunt Reactor

Clause 2.2.1 245kV, 3-Phase, Shunt Reactor</td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation

Clause 2.2 Shunt Reactor

Clause 2.2.1 245kV, 3-Phase, Shunt Reactor</td></tr>
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<tr><th>S. No.</th><th>Existing Provision</th><th>Amended Provision</th></tr>
<tr><td></td><td>Reactor shall conform to IEC 60076-6 ….
…..
The neutral of bus reactor shall be solidly grounded.
The major technical particulars / parameters of 3-phase, 31.5 MVAr, 245kV Shunt Reactor are given below:
<table>
<tr><th>Sl. No.</th><th>Description</th><th>Unit</th><th>Technical Parameters</th></tr>
<tr><td>1.</td><td>Rated Capacity at 245kV</td><td>MVAr</td><td>31.5</td></tr>
<tr><td>2.</td><td>….</td><td>…</td><td>…</td></tr>
<tr><td>…</td><td>…</td><td>…</td><td>…</td></tr>
<tr><td>24.</td><td>…</td><td>…</td><td>…</td></tr>
</table></td><td>31.5 MVAR, 245 kV Shunt Reactor shall be as per “Standard Specifications and Technical Parameters for Transformers and Reactors (66 kV and above)” available on CEA website shall be followed.
The major technical particulars / parameters of 3-phase, 31.5 MVAr, 245kV Shunt Reactor are given below:
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<tr><td>3.</td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation
Clause 2.2 Shunt Reactor
Clause 2.2.1 245kV, 3-Phase, Shunt Reactor
The Technical Particulars / Parameters of 3-phase, 31.5 MVAr, 245kV Shunt Reactor are given below:
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Clause 2.2 Shunt Reactor
Clause 2.2.1 245kV, 3-Phase, Shunt Reactor
New Insertion at Sl. No. 25 in Technical Particulars / Parameters of 3-phase, 31.5 MVAr, 245kV Shunt Reactor
The Technical Particulars / Parameters of 3-phase, 31.5 MVAr, 245kV Shunt Reactor are given below:
<table>
<tr><th>Sl. No.</th><th>Description</th><th>Unit</th><th>Technical Parameters</th></tr>
<tr><td>1.</td><td>Rated Capacity at 245kV</td><td>MVAr</td><td>31.5</td></tr>
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<tr><td>25.</td><td>Maximum Permissible Losses of Reactor at rated current and frequency and at 75°C for 31.5 MVAR, 245kV 3-Phase, Bus reactor
(a) Total Loss
(b) I^2R Loss</td><td>kW</td><td>60
35</td></tr>
</table>
</td></tr>
<tr><td>4.</td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation

Clause 2.4.5 Surge Arresters (AIS)

216kV & 120kV Station Medium (SM) class, duty gapless type Surge arresters conforming to IEC 60099-4 in general shall be provided for 220 kV & 132kV systems respectively.

Other characteristics of Surge arrester ……. each surge arrester.</td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation

Clause 2.4.5 Surge Arresters (AIS)

245kV & 145kV Station Medium (SM) class duty, gapless type Surge arresters conforming to IEC 60099-4 in general with switching impulse discharge current of 1 kA, repetitive charge transfer rating (Qrs) of minimum 1.6C and thermal energy (Wth) of minimum 7kJ/kV, shall be provided for 220 kV & 132kV systems respectively.

Other characteristics of Surge arrester …… each surge arrester.</td></tr>
<tr><td>5.</td><td>Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Transmission Line

7.0 The relevant conductor configuration shall be as follows:-
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<tr><th>Transmission line</th><th>ACSR Conductor specified</th><th>Equivalent AAAC conductor based on 53.5% conductivity of Al Alloy</th><th>Equivalent AL59 conductor based on 59% conductivity of AL Alloy</th><th>Subconductor Spacing</th></tr>
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S. No.	Existing Provision	Amended Provision
	400kV D/C (Twin Moose) transmission lines … … … …	400kV D/C (Twin Moose) transmission lines … … … …
	132kV D/C (Panther) transmission lines … … … … Minimum UTS : 66.47 kN	132kV D/C (Panther) transmission lines … … … … **Minimum UTS : 65.47 kN**
6.	**Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Transmission Line** **8.0** The required phase to phase spacing and horizontal spacing for 400kV line shall be governed by the tower design as well as minimum live metal clearances for 400kV voltage level under different insulator swing angles. However, the phase to phase spacing for 400kV lines shall not be less than 8m.	Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Transmission Line 8.0 The required phase to phase spacing and horizontal spacing for **132 kV & 400kV** line shall be governed by the tower design as well as minimum live metal clearances for **respective voltage levels** under different insulator swing angles. However, the phase to phase spacing for 400kV lines shall not be less than 8m.
7.	**Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation** **Clause 4.0 General Facilities** a)… … d)…	Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation Clause 4.0 General Facilities a)… … d)… **New Insertion** **e) Boundary wall shall be brick masonry wall with RCC frame or Stone masonry wall or Precast RCC wall under present scope along the property line of complete substation area (including future switchyard area) to prevent encroachment and**

S. No.	Existing Provision	Amended Provision
		unauthorized access with minimum height of 1.8 m from finished ground level (FGL) as per CEA Measures Relating to Safety and Electric Supply Regulations.
8.	**Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation** **Clause 2.3 220kV GIS Substation equipment** GIS (Gas Insulated Switchgear) shall be Indoor type in accordance to IEC: 62271-203……. ….. **Service continuity requirement for GIS:** …… • For Double Main bus switching scheme, during a fault in Circuit Breaker compartment, no bus bar is 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 is permitted out of service during maintenance and repair/replacement. **UHF sensors in GIS for PD (Partial Discharge) detection:** **…….**	Annexure-1 to Amendment No. 1 - Revised Specific Technical Requirements for Substation Clause 2.3 220kV GIS Substation equipment GIS (Gas Insulated Switchgear) shall be Indoor type in accordance to IEC: 62271-203……. ….. **Service continuity requirement for GIS:** …… • For Double Main bus switching scheme, during a fault in Circuit Breaker compartment, no bus bar is permitted out of service during maintenance and repair/replacement. • **Deleted** UHF sensors in GIS for PD (Partial Discharge) detection: **…….**
9.	**RfP** **Annexure-8: Undertaking and details of Equity Investment** Sl. No. 3 of Format 1 We give our unconditional acceptance to the RFP dated March 06, 2020 issued by the BPC and the RFP Project Documents, as amended, and undertake to ensure that the TSP shall execute the Share Purchase Agreement as per the provisions of this RFP.	**RfP** **Annexure-8: Undertaking and details of Equity Investment** Sl. No. 3 of Format 1 We give our unconditional acceptance to the RFP dated **February 04, 2021** issued by the BPC and the RFP Project Documents, as amended, and undertake to ensure that the TSP shall execute the Share Purchase Agreement as per the provisions of this RFP.
10.	**RfP, TSA and SPA Documents**	**RfP, TSA and SPA Documents**

S. No.	Existing Provision	Amended Provision
	All the relevant clauses of RfP, TSA, SPA Documents **"SPV, which is under incorporation"**	All the relevant clauses of RfP, TSA, SPA Documents **"SPV, which is under incorporation"** in the RfP, TSA and SPA documents may be replaced with **"Nangalbibra - Bongaigaon Transmission Limited"**