

SCOPE OF WORK (SOW)

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1. GENERAL

Gurgaon-Palwal Transmission Ltd. ("GPTL") is implementing 2 no. of 220 kV GIS line bays along with 220kV Cable for line bay interconnection at Prithala S/s (GPTL) ("Project").

1.1.Associated Transmission System:

The following transmission system is envisaged under the scheme:

- 220 kV line bays (GIS) – 2 nos.
- 220 kV Cable for line bay interconnection- 1 Lot

2. SCOPE OF WORK

The scope of work shall cover following:

Design, engineering, supply, testing at manufacturer's works, transportation, unloading and delivery at site including insurance & storage, associated civil works including strengthening of PEB structure as required, erection, testing and commissioning at site along with all equipment's, fittings, accessories, foundation bolts (if any), Mandatory Spare Parts and Condition Monitoring Instruments at Prithala (GIS) Substation on LSTK basis as per the details given below:

- 220 kV line bays (GIS) – 2 nos.
- 220 kV Cable for line bay interconnection- 1 Lot

Note:

- For making the connections from GIS switchgear to line side AIS equipment, 220kV XLPE Cable is envisaged as per Technical Specification.
- The 400/ 220 kV Prithala (GIS) Substation is under operation and the above scope of work to be carried out with utmost safety and the work shall be planned in a manner that operation of the existing substation does not get affected. The shutdown will be provided to the Contractor for necessary activities and requisition of same shall be submitted at least three (3) months in advance. The requirement of shutdown shall be discussed and mutually agreed between the Parties based on the Prudent Engineering Practices.

3. BID PRICE SCHEDULE:

The Bid Price Schedule is attached separately in Volume-III.

4. PHYSICAL AND OTHER PARAMETERS

4.1. Location of the substation - The location of substation is indicated below:

Name of Substation	Tentative Co-ordinates	Name of State	Address
400/220KV GIS Substation - Prithala	<ul style="list-style-type: none"> • X = 727508052 Y = 3120621971 • X = 727505322 Y = 3120818003 • X = 727586015 Y = 3120819403 • X = 727585536 Y = 3120869689 • X = 727665540 Y = 3120871341 • X = 727665824 Y = 3120842480 • X = 727660862 Y = 3120842397 • X = 727637868 Y = 3120820202 • X = 727666281 Y = 3120820679 • X = 727667986 Y = 3120720204 • X = 727590990 Y = 3120718750 • X = 727587595 Y = 3120713823 • X = 727564821 Y = 3120668212 • X = 727523727 Y = 3120621888 	Haryana	Village Bhagola, Tehsil Palwal, District Palwal, Haryana 121102

4.2. Access to Site -

Employer shall provide land for the said augmentation work at Prithala Substation ("Site") with non-exclusive access and handover such portion of the Site to Contractor on as is basis to commence the services under the Contract.

The Contractor shall (and shall cause all its sub-contractors) use only the entrance(s) to the Site specified by Employer for ingress and egress of all Contractor's and its Subcontractors' personnel, the Services, Contractor's Equipment, vehicles and the like.

The Contractor shall be responsible for planning and conducting its operations and those of its sub-contractors so that neither the Contractor nor any of its sub-contractor shall (a) enter upon lands (other than the designated Site) or waterbodies in their natural state unless authorized by the Project Manager and or appropriate person; (b) close or obstruct any utility installation, highway, waterway, harbor, road or other property unless applicable permits are obtained and authorized by the Project Manager and or appropriate person; or (c) disrupt or otherwise interfere with the operation of any portion of any pipeline, telephone, conduit or electric transmission line, ditch, navigational aid, dock or structure unless otherwise specifically authorized by the appropriate Person.

4.3. Meteorological data - For design purposes, meteorological data are as below:

Altitude	Less than 1000 meters above mean sea level (MSL)
Snow Fall	NIL
Seismic Zone	As per IS 1893-2002
Wind Zone	Wind map as per National Building Code - 2016 (Volume-I)
Min./Max. Design Ambient Temperature	-5°C to +50°C
Creepage Requirement	As per Technical Specification
Coastal Area consideration	NIL

4.4. Fault Level- The system fault level is as mentioned below:

Sl. No	Substation	220 kV
1	400/ 220 kV Prithala (GIS)	50kA for 1 second

5. SCHEDULE OF QUANTITIES

This work is to be awarded on LSTK basis including design, engineering, supply, testing at manufacturer's works, transportation, unloading and delivery at site including insurance & storage, associated civil works including strengthening of PEB structure as required, erection, testing and commissioning at site along with all equipment's, fittings, accessories, foundation bolts (if any), Mandatory Spare Parts and Condition Monitoring Instruments.

The Contractor shall submit a detailed BOQ/ Billing Breakup, for Employer's review and approval, within 15 days of the Effective Date for billing and invoicing purpose, however the total price shall be restricted to the Contract Price.

The bidder is required to estimate the quantities required for entire execution and completion of works and incorporate their price in respective Bid Price Schedule. The bidder shall include all such items in the BOQ / Billing Breakup, which are not specifically mentioned but are essential for the execution of the contract. Items which are not mentioned in the BOQ/ Billing Breakup and required for successful commissioning of the Facilities shall be included in the Bid Price quoted by the bidder and shall be provided at no extra cost to the Employer.

The Format for BOQ/ Billing Breakup has been annexed as Annexure- A(SOW).

6. REFERENCE DRAWINGS

The following drawings are enclosed for reference purposes of the Bidder.

1. Tentative Plan marked on existing Layout.
2. Existing SLD
3. Existing Earthing Layout for Switchyard-Outdoor
4. Existing Earthing Layout for Switchyard-Indoor
5. Existing outdoor Cable Trench Layout
6. Indicative Drawings – Civil Works

Note:

1. *In case of any discrepancy between the drawings and text of specification, the requirements of text shall prevail in general. However, the bidder is advised to get these clarified from the Employer.*
2. *For PEB/GIS building, Bidders are advised to go through Clause 17 of Technical Specification for Substations – Civil Works.*

7. DIFFERENT SECTIONS OF TECHNICAL SPECIFICATION

For the purpose of scope of work, technical specification shall consist of following sections, and they should be read in conjunction with each other.

1. Technical Specification for Augmentation of Prithala (GIS) Substation - Civil & Structure Works

2. Technical Specification for Augmentation of Prithala (GIS) Substation – Electrical Works.

8. MANDATORY SPARE PARTS AND CONDITION MONITORING INSTRUMENTS

The Mandatory Spare Parts and Condition Monitoring Instruments shall be included in the bid proposal by the bidder. The prices of these spares/ instruments (as the case may be) shall be quoted by the Bidder in the Bid Price Schedule and shall be considered for evaluation of bid. The Bidder shall submit the detailed price breakup in the BOQ/ Billing Breakup. The list of Mandatory Spare Parts and Condition Monitoring Instruments is attached in Annexure- B(SOW) and Annexure-C (SOW) respectively.

The Bidder is clarified that no mandatory spares shall be used during the commissioning of the Facilities. Any spares required for commissioning purpose shall be arranged by the Contractor at its own expense. The unutilized spares, if any, brought for commissioning purpose shall be taken back by the Contractor.

9. SPECIFIC REQUIREMENT

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ANNEXURES

ANNEXURE- A (SOW)Supply:

<u>S. No.</u>	<u>Item Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Rate (including Freight and Insurance)</u>	<u>GST (INR)</u>	<u>Total Amount (INR)</u>

Service:

<u>S. No.</u>	<u>Item Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Rate</u>	<u>GST (INR)</u>	<u>Total Amount (INR)</u>

ANNEXURE-B (SOW)
List of Mandatory Spare Parts

S. NO.	Description of Spare	Qty.
A.	Mandatory Spares for Air Insulated Switchgears (AIS)	
1.0	245kV CAPACITIVE VOLTAGE TRANSFORMER	
1.1	Complete Capacitor Voltage Transformer with terminal connectors & structure	1 No.
2.0	216kV SURGE ARRESTOR	
2.1	Complete Surge Arrester with insulating base and Terminal connector & structure	1 No.
2.2	Surge counter/monitor	2 Nos.
3.0	Control & Protection System	
3.1	Line Protection Panel Equipment Spare	
3.1.1	Numerical distance relay (Main-I) with in-built DR and fault locator, OV protection, software	1 No.
3.1.2	Numerical distance relay (Main-II) with in-built DR and fault locator, OV protection, software	1 No.
4.0	Substation Automation/SCADA System	
4.1	Bay Control Unit (IED)	1 No.
4.2	Bay Ethernet switch	1 No.
5.0	Conductor (Flexible / Aluminum Pipe)	5% of the length of each type installed at the substation / switchyard
6.0	INSULATORS	
6.1	DISC INSULATORS (IF APPLICABLE)	5% of the total number of discs of each voltage class installed at the substation/switchyard.
6.2	LONG ROD INSULATORS	5% of the total number of insulators of each voltage class installed at the substation / switchyard subject to a minimum no. of 3 insulators of each voltage class.
7.0	CONDUCTOR ACCESSORIES AND HARDWARE	Qty. shall be commensurate with the spare for conductor and insulator.

S. NO.	Description of Spare	Qty.
8.0	Clamps, Connectors, Shield Wire, CO2 type portable fire extinguishers, spacers, welding sleeves, corona bells,	5% of the total qty. of each type installed at the substation / switchyard with min. 1 no. of each item
9.0	Illumination System	5% of total qty. of each type of fixture installed at the substation / switchyard with min. 1 no. of each fixture type
10.0	EHV Cable	
10.1	Spare EHV Cable of longest phase of a feeder as applicable (if applicable)	1 Run (1-phase)
10.2	HV Cable Termination kit of each type (if applicable)	1 No.
10.3	HV Cable Jointing kit of each type (if applicable)	1 No.
B.	Mandatory Spares for Gas Insulated Switchgears (GIS)	
1.0	General	
1.1	SF6 gas Pressure Relief Devices of each type along with O-rings	2 sets
1.2	SF6 Pressure gauge cum switch OR Density monitors and pressure switch, as applicable, of each type	2 sets
1.3	Coupling device of each type for pressure gauge cum switch for connecting Gas handling plant	2 sets
1.4	Rubber Gaskets, "O" Rings and Seals for SF6 gas of each type	2 sets
1.5	Molecular filter for SF6 gas with filter bags	5% of total weight
1.6	All types of Control Valves for SF6 gas of each type	2 Nos.
1.7	SF6 gas	20% of total gas quantity
1.8	Locking device to keep the Dis-connectors (Isolators) and Earthing/Fast Earthing switches in close or open position in case of removal of the driving Mechanism	3 Nos.
1.9	UHF PD Sensors of each type along with BNC Connector	3 Nos.
1.10	Support Insulators (gas through) of each type (complete with metal ring etc.) along with associated contacts and shields	3 Nos.
1.11	Gas Barriers of each type (complete with metal ring etc.) along with associated contacts and shields	3 Nos.
1.12	Aux. relays, Contactors, Push Buttons, Switches, Lamps, Annunciation Windows, MCB, Fuses, Timers, Terminal Blocks etc. of each type & rating for Local control cabinet	1 Set
2.0	SF6 CIRCUIT BREAKER:	
2.1	Circuit Breaker (1 phase unit) with interrupter, main circuit, enclosure and Marshalling Box with operating mechanism complete in all respect	1 set
2.2	Trip coil assembly with resistor as applicable	2 Sets
2.3	Closing coil assembly with resistor as applicable	2 Sets

S. NO.	Description of Spare	Qty.
2.4	Relays, Power contactors, push buttons, timers & MCBs etc. of each type (as applicable)	1 set
2.5	Auxiliary switch assembly of each type	1 set
2.6	Operation Counter	1 set
2.7	For Spring Operated Mechanism, if applicable	
2.7.1	Complete Spring Operating Mechanism including charging mechanism etc. of each type	1 set
2.7.2	Spring Charging Motor	2 Nos.
3.0	Disconnecter Switches/Earthing Switches	
3.1	1-phase of 2000A disconnecter switch including main circuit, enclosure, driving mechanism and support insulator etc., complete in all respect as per TS	2 set
3.2	1-phase Maintenance Earthing switch including main circuit, enclosure, driving mechanism and support insulator etc., complete in all respect	1 set
3.3	1-phase Fast Earthing switch including main circuit, enclosure, driving mechanism and support insulator etc., complete in all respect (if applicable)	1 set
3.4	Open/Close contactor assembly, timers, key interlock, interlocking coils, relays, push buttons, indicating lamps, Power contactors, resistors, fuses, MCBs & drive control cards etc. one of each type for one complete MOM box (as applicable)	
3.4.1	For Disconnecter	1 Set
3.4.2	For Maintenance Earth switch	1 Set
3.4.3	For Fast Earthing Switch (if applicable)	1 Set
3.5	Limit switches and Aux. Switches for one complete MOM box	
3.5.1	For Disconnecter	1 Set
3.5.2	For Maintenance Earth switch	1 Set
3.5.3	For Fast Earthing Switch (if applicable)	1 Set
3.6	Drive Mechanism	
3.6.1	For Disconnecter	1 Set
3.6.2	For Maintenance Earth switch	1 Set
3.6.3	For Fast Earthing Switch (if applicable)	1 Set
3.7	Motor for Drive Mechanism	
3.7.1	For Disconnecter	1 Set
3.7.2	For Maintenance Earth switch	1 Set
3.7.3	For Fast Earthing Switch (if applicable)	1 Set
4.0	CURRENT TRANSFORMER	
4.1	1-phase of Current Transformer with associated enclosure and primary conductor complete in all respect	1 No

Note:

1. Any equipment which is not supplied as main equipment or part of main equipment, mandatory spare for that is not applicable.
2. In case contractor offers circuit breaker, dis-connector, current transformer, SF6/ Air Bushing etc. under main equipment of higher rating than equipment rating specified in the specifications, the mandatory spare of same higher rating offered by contractor identical to main equipment offered in the package shall be required to be supplied against spares without any cost implication to Employer.
3. The contractor shall supply spare for disconnector switch to ensure one to one replacement of all disconnector switch supplied as main equipment without any requirement of modification in fittings at site to cover all different types of disconnector switch supplied. In case, quantity of supplied dis-connector switch types (for one-to-one replacement) are more than the quantity mentioned for spare, the contractor shall supply these additional types of disconnector switch without any additional price implication to Employer and quantities of these additional type of disconnector switch are deemed to be included in the quantities mentioned for spare disconnector.
4. In case, Dis-connector Switch (DS) & Earth Switch (ES) is provided in a same enclosure with common/separate operating mechanism, then the module comprising of Dis-connector & Earth switch in single enclosure with common/separate operating mechanism is to be provided under the head of spare Dis-connector only.

ANNEXURE-C (SOW)
List of Condition Monitoring Instruments

S. No.	Name of Device	Qty. (in Nos.)	Application
1.	SF6 Gas Quality Analyzer	1	Online measurement of Moisture (Dew point & ppm), Purity & SO2 content of SF6 Gas in gas insulated EHV equipment
2.	DC Earth fault locator	1	To locate earth faults on live Floating 220V/110V DC system in EHV Sub-station up to length of 1km without isolating any circuits
3.	Automatic Third Harmonic Resistive Current Measurement Kit	1	Online measurement of 3 rd Harmonic resistive current of Gapless surge arrester
4.	Precision Grade Digital Multi-meter	2	Measurement of AC RMS Voltage with accuracy of (+/-) 0.5 % Accuracy

----- End of Scope of Work -----