

Power Grid Company of Bangladesh Limited (PGCB)

Construction of 230kV Transmission Line and Substation at Araihaaz JEZ area (Package-2)

Addendum No. 1

(Date: October 09 , 2023)

Following revisions/ changes are made in the Tender Document which will form part of the Tender Document

Volume 1 of 3

1. Section 3: Evaluation and Qualification Criteria

Clause 2.5 (a) Manufacturers/Subcontractors of Major Item/Plants

Minimum Criteria to be met & Submission Requirements for Item No 4: Fittings for Conductor, Insulator & OPGW have been modified as:

Existing Text		Replaced By	
Minimum Criteria to be met	Submission Requirements	Minimum Criteria to be met	Submission Requirements
• Bidders shall furnish copies of ISO 9001 or equivalent certificates of proposed manufacturers. • At least last ten (10) years of supply record prior to the date of bid submission in manufacturing of equipment of the proposed manufacturers for similar or higher ratings. • At least last ten (10) years of supply record prior to the date of bid submission in manufacturing of equipment of the proposed manufacturers for similar or higher ratings. • The said equipment (similar or higher rating) shall be	• List of Subcontractors as per Section IV. Bidding Forms • Certificate of ISO 9001 or equivalent. (to be attached to List of Subcontractors) • Reference list: Bidder shall provide Manufacturer's supply record (Reference list) of said equipment for the last ten (10) years. (to be attached to List of Subcontractors) • User's letter: At least one evidence from end users for satisfactory service. (to be attached to List of Subcontractors) • Manufacturer's Authorization letter. (Form MAN)	• Bidders shall furnish copies of ISO 9001 or equivalent certificates of proposed manufacturers. • At least last ten (10) years of supply record prior to the date of bid submission in manufacturing of equipment of the proposed manufacturers for similar or higher ratings. • At least last ten (10) years of supply record prior to the date of bid submission in manufacturing of equipment of the proposed manufacturers for similar or higher ratings. • The said equipment (similar or higher rating) shall be in satisfactory	• List of Subcontractors as per Section IV. Bidding Forms • Certificate of ISO 9001 or equivalent. (to be attached to List of Subcontractors) • Reference list: Bidder shall provide Manufacturer's supply record (Reference list) of said equipment for the last ten (10) years. (to be attached to List of Subcontractors) • User's letter: At least one evidence from end users for satisfactory service. (to be attached to List of Subcontractors) • Manufacturer's Authorization letter. (Form MAN)

in satisfactory service for a minimum of three (3) years as on the date of bid opening. Evidence from end users of satisfactory service mentioned above shall be in the end user's respective letterhead stationery indicating address, telephone and fax numbers of the users. • Manufacturer's authorization letter.		service for a minimum of three (3) years as on the date of bid opening. Evidence from end users of satisfactory service mentioned above shall be in the end user's respective letterhead stationery indicating address, telephone and fax numbers of the users. • Manufacturer's authorization letter. • Type Test Report for the offered combination of Insulator & Fittings • Type test report of OPGW & OPGW Fittings	• Type test report for offered combination of Insulator & Fittings as per clause no 9.6.2, Volume 2 of 3 (Transmission Line) • Type Test Report of OPGW & OPGW Fittings as per clause 14.7.1, Volume 2 of 3 (Transmission Line)
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2. Section 4: Bidding Forms

Schedule of Adjustment Data for Local Currency & Foreign Currency; (Page BF-9 &10)

Table for Adjustment Data for Local Currency & Foreign Currency has been replaced (See **Attachment-1**)

3. Section 9: Contract forms

Appendix 2: Price Adjustment: (1) Transformer; page 9-11

Existing Text	Replaced By
P_0 = Contract Price (Base Price)	P_0 = Contract Price of transformer (Base Price)

4. Section 9: Contract forms,

Appendix-1 (A)-Terms of Payment

The text "**LIBOR**" is replaced by the text "**SOFR**".

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Volume 2 of 3 (Transmission Line)

1. Section 1: Scope of Works, Annex 1-3

The text "The Contractor shall collect all these materials to build the bypass line, from the PGCB stores, as free issue items and shall transport to the required site and install these materials, to commission into service the temporary line. These materials will be provided from existing PGCB store materials." is replaced by the text "The contractor shall collect all these materials, from the PGCB stores, on rent basis and shall transport to the required site and install these materials, to commission into service the temporary line".

2. Section 9 Insulators : Clause 9.6.2 (ii), Page- 9-7-

Existing Text	Replaced By
Bidder shall submit complete and satisfactory type test report (performed in laboratories mentioned in Clause 9.6.2 (i)) for offered combination of insulator & fitting manufacturer (except low duty sets) with proposed design during bidding stage	Bidder shall submit complete and satisfactory type test report (performed in laboratories mentioned in Clause 9.6.2 (i)) for offered combination of insulator & fitting manufacturer [except low duty & jumper suspension (in case of similar design to suspension sets) sets] with proposed design during bidding stage

3. Section 23: Reference Data, Annex 23-1

Annex 23-1 –Line Route Map is replaced by revised Line Route Map (Rev-A) [Attachment-2]

Volume 3 of 3

i) Price Schedule LILO- JEZ Araihaazar: Schedule No. B4. Installation and Other Services

Description of Item No 11.2 has been modified (see Attachment-3)

ii) Price Schedule- Substation Part (II), Price Schedule JEZ Substation: Schedule B1; Section IV: Mandatory Spare Parts for 230/33kV Substation

Item No. 4A9 are revised (see Attachment-4)

iii) Price Schedule- Substation Part (II), Price Schedule JEZ Substation: Schedule B2; Section IV: Mandatory Spare Parts for 230/33kV Substation

Item No. 4A9 and 4A11 are revised (see Attachment-5)

iv) Price Schedule- Substation Part (II), Price Schedule JEZ Substation

Description of Item No. 2C10 of Schedules B1, B2 & B4.1 of Price Schedule is revised as follows:

Item	Description
2C10	Complete SAS system: hardware (Server, Operator Work Station, firewall, gateway, GPS clock, switch, cable (Fiber optic, Ethernet, copper), embedded computer for tele-metering - if required, HMI, engineering computer, printer & change over power supply- components depending on the detailed design) & software.

v) Price Schedule- Substation Part (II), Price Schedule JEZ Substation

Description of Item No. 3C3 of Schedules B1, B2 & B4.1 of Price Schedule is revised as follows:

Item	Description
3C3	Complete SAS system: hardware (Server, Operator Work Station, firewall, gateway, GPS clock, switch, cable (Fiber optic, Ethernet, copper), HMI, engineering computer, printer and change over power supply - components depending on the detailed design) & software.

vi) Price Schedule- Substation Part (II), Price Schedule JEZ Substation

Description of Item No. 3C1 of Schedules B1, B2 & B4.1 of Price Schedule is revised as follows:

Item	Description
3C1	Control, Monitoring, Protection & Substation Automation System including event recording function for 33kV station. For 33kV GIS bays Protection relays and BCU shall be installed on the respective Local Control Panel of GIS of item no. 3B1.

3. SCHEDULE A, SCHEDULES OF REQUIREMENTS, Section III., The 230/33kV Substation (part 2/2) - 33kV Station, Volume 3 of 3 of the Bidding Document

Item No. 3C1 is revised as follows:

Control, Monitoring, Protection & Substation Automation System including event recording function for 33kV station. For 33kV GIS bays Protection relays and BCU shall be installed on the respective Local Control Panel of GIS of item no. 3B1. Protection relays and BCU shall be manufactured by ABB (Switzerland/Sweden), Alstom/GE (France/UK/USA), Siemens (Germany), or SEL (USA). Moreover, two 33kV incomer feeders and four 33kV outgoing feeders shall have control from 33kV station, 230kV station and NLDC.

4. Schedule E: Technical Particulars and Guarantees, GTP & requirement Form: Transformer, 230/34.5kV, 120/140MVA, 3-Phase Power Transformer, Volume 3 of 3 of the Bidding Document

Clause Nos. 3.1 & 3.2 are revised as follows:

No.	Description	Minimum Requirements		Guaranteed
		Unit	Data	
3.1	Short circuit impedance corrected to reference temperature of 75°C at rated frequency and rated power			
3.1.1	HV – LV, on the basis of rated power with on-load tap changer			
	• in middle position	%	15±10%	
	• in extreme plus position	%	Insert	
	• in extreme minus position	%	Insert	

3.1.2	Maximum Impedance between HV – LV over tapping range. Corresponding tap	%	Insert	
3.2	Zero-sequence impedance, with tap changer in middle position at 140MVA base: HV/LV	%	≥ 90% of short circuit impedance between HV – LV, on the basis of rated power with on-load tap changer in middle position.	

5. Schedule E: Technical Particulars and Guarantees, Volume 3 of 3 of the Bidding Document

GTP of 33kV BCU is added after “1.1.1.4 Bay Control Unit (BCU) & Protection Unit (BCPU)”. See **Attachment-6**.

6. “Schedule H: Drawings and Documents to Be Submitted with Bid” is added as “**Attachment-7**” after SCHEDULE G of Volume 3 of 3 of the Bidding Document.

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Schedule of Adjustment Data

Table A. Local Currency

(i)	(ii)	(iii)	(iv)		(v)
Index Code	Index Description	Source of Index	Base Cost Index ³		Total Amount ¹ (Each Index)
			Value	Date	
	Non-adjustable	-	-	-	
L₀	Labor				
M₀₁	Si-Steel				
M₀₂	Copper				
M₀₃	Steel				
M₀₄	Zinc				
Total					1.00

Notes for the Bidders

1. The Bidder shall fill in column (v), the Total Amount of each index component (i.e.: labor, material, equipment etc as stated in column (ii)) quoted in the local currency.
2. The Total Amount of the relevant “Non-adjustable” component shall also be indicated in the corresponding cell.

The bidder's will take the value 'a' 'b' 'c' 'd' 'e' 'f' from the Section 9, Contract forms (Price Adjustment), Volume 1 of 3.

3. The Values and the Dates of the Base Cost Index(ices) will be provided by the Employer prior to contract signing.
4. If any difficulties arise, the source of index may be changed before contract signing by mutual agreement.

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Table B. Foreign Currency¹Payment Currency²: _____

(i)	(ii)	(iii)	(iv)		(v)		(vi)		(vii)
Index Code	Index Description	Source	Base Cost Index ⁴		Total in Source Currency ⁵		Total in Payment Currency ⁶		Bidder's proposed weighting ⁷
		Index ³	Value	Date	Type	Amount	Exchange	Amount	
	Non-adjustable	-	-	-	-	-			a:
L₀	Labor								b:
M₀₁	Si-Steel								c:
M₀₂	Copper								d:
M₀₃	Steel								e:
M₀₄	Zinc								f:
Total									1.00

Notes for the Bidders

1. If so provided in BDS 15.1 in case of Single-Stage Two-Envelope Bidding and in BDS 31.1 in case of Two-Stage One-Envelope Bidding, the Bidder may quote in more than one foreign currency and, then this table should be repeated for each of those foreign currencies.
2. The Bidder shall indicate at the top of the table, the type of the foreign currency.
3. The Bidder shall indicate the source of each index in column (iii).
4. The Bidder may leave the Values and the Dates of the Base Cost Indices in column (iv) blank. If they are not available prior to submission of the Bid, due to absence of the

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relevant publication. However, the Bidder shall provide such Values and Dates prior to contract signing.

5. The Bidder shall fill in Column (v) the Total Amount of each index component (i.e.: labour, material, equipment, etc as stated in column (ii)) to be procured in a particular Source Currency.

For the purposes of this Schedule, the "Source Currency" of any index component means the currency, in which that index component is intended to be procured by the Bidder.

If the Source Currency of any index component is as same as the Payment Currency of this table, the Bidder may leave the corresponding cell of column (v) blank.

6. The Bidder shall derive the Total Amount in Payment Currency in Column (vi) by applying the Exchange Rate prevailing on the Base Date (as defined in Sub-Clause 1.1 of the Conditions of Contract), as published by the central bank of the Source Country, to the Total Amount in Source Currency in column (v).

7. The Total Amount of the "Non-adjustable" component quoted in the subject foreign currency shall also be indicated in the corresponding cell.

The bidder's will take the value 'a' 'b' 'c' 'd' 'e' 'f' from the Section 9, Contract Forms (Price Adjustment), Volume 1 of 3.

8. If any difficulties arise with the mentioned index, the source of index may be changed before contract signing by mutual agreement





NOTE: New Tower Locations are Tentative. Dimensions are in MM

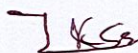
Contract Name: Design, Supply, Installation, Testing & Commissioning of Line-in-Line-Out (LILO) of 230 kV Bhulta-Ghorashal Double Circuit Transmission Line at Araihaazar, Narayanganj for Japanese Economic Zone		DRAWING No PGCB/230kV LILO/ ARAIHAZAR-1
Employer: Power Grid Company of Bangladesh Limited (PGCB)	Rev A	TITLE Route Alignment Drawing of Line-in-Line-Out (LILO) of 230kV Bhulta-Ghorashal TL at Araihaazar

Construction of 230kV Transmission Line and Substation at Araihaazar JEZ area (Package-2)

Price Schedule- Transmission Part (I),

Description of Item No. 11.2, Schedule No. B4. Installation and Other Services of Price Schedule is revised as follows:

Item	Description
11.2	Bypass of existing double circuit line has to be constructed to facilitate in-out. Pole/ERS for bypass line shall be collected from PGCB stores by paying applicable rent. Insulators & fittings have to be used from existing facilities. All costs of collecting materials from pgcb stores and removing of bypass line and storage of all materials at Employer's stores is deemed included in the quoted price.



Attachment-4

Item	Description	Code' (Country of origin)	Unit	Quantity	Foreign Currency (in.....)		Remark
					Unit Price	Total Price	
					CIP	CIP	
				(1)	(2)	(3) = (1) x (2)	
4A9	Testing equipment and special tools for operation and maintenance						
i	SF6 Gas Treatment Plant for Gas Filling, Recovery, Evacuation, Filtering, Drying and Storage with all accessories	EU, USA, UK or Japan	Set	1			
ii	SF6 leakage detector,	EU, USA, UK or Japan	Set	1			
iii	Portable Partial Discharge (PD) monitoring system for GIS	EU, USA, UK or Japan	Set	1			
iv	Oxygen Analyzer,	EU, USA, UK or Japan	Set	1			
v	GIS gas Analyzer,	EU, USA, UK or Japan	Set	1			
vi	Moisture Meter	EU, USA, UK or Japan	Set	1			
vii	3-phase Portable earthing devices (for maintenance) with connectors and telescopic glass fibre operating pole suitable for plant	EU, USA, UK or Japan	Sets	2			
viii	Circuit breaker operational analyzer with accessories including connecting lead	EU, USA, UK or Japan	Set	1			
ix	Contact resistance measurement test set (suitable for measurement down to 1 μ ohm at 10A d.c.)	EU, USA, UK or Japan	Set	1			
x	5 kV insulation resistance test set (range 0.5 –1.0 - 2.5 - 5 kV)	EU, USA, UK or Japan	Set	1			
xi	Earth resistance test set (range 10-100-1000 ohm: min scale division 0.1 ohm)	EU, USA, UK or Japan	Set	1			
xii	Clip-on mA meter (for spill current)	EU, USA, UK or Japan	Set	1			
xiii	Thermovision camera	EU, USA, UK or Japan	Set	1			
xiv	Portable Lightning Arrester Diagnostic System (PLADS)	EU, USA, UK or Japan	Set	1			
xv	SF6 cylinder		Sets	2			

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Item	Description	Unit	Quantity	Local Currency (in BDT)		Remark
				Unit Price	Total Price	
			(1)	EXW	EXW	
			(1)	(2)	(3) = (1) x (2)	
4A9	Testing equipment and special tools for operation and maintenance					
i	SF6 Gas Treatment Plant for Gas Filling, Recovery, Evacuation, Filtering, Drying and Storage with all accessories	Set	1	Refer to Schedule B1		
ii	SF6 leakage detector,	Set	1			
iii	Portable Partial Discharge (PD) monitoring system for GIS	Set	1			
iv	Oxygen Analyzer,	Set	1			
v	GIS gas Analyzer,	Set	1			
vi	Moisture Meter	Set	1			
vii	3-phase Portable earthing devices (for maintenance) with connectors and telescopic glass fibre operating pole suitable for plant	Sets	2			
viii	Circuit breaker operational analyzer with accessories including connecting lead	Set	1			
ix	Contact resistance measurement test set (suitable for measurement down to 1 μ ohm at 10A d.c.)	Set	1			
x	5 kV insulation resistance test set (range 0.5 –1.0 - 2.5 - 5 kV)	Set	1			
xi	Earth resistance test set (range 10-100-1000 ohm: min scale division 0.1 ohm)	Set	1			
xii	Clip-on mA meter (for spill current)	Set	1			
xiii	Thermovision camera	Set	1			
xiv	Portable Lightning Arrester Diagnostic System (PLADS)	Set	1			
xv	SF6 cylinder	Sets	2			
4A11	Set of Tools for each substation (as per table of section III, schedule A: SCHEDULES OF REQUIREMENTS of volume 3 of 3 of tender document)			Refer to Schedule B1		

1.1.1.4.1 Bay Control Unit (BCU) & Protection Unit (BCPU) for 33kV Feeder:

No.	Description	Unit	Minimum Requirements	Guaranteed
			Data	
1	Manufacturer		ABB/SIEMENS/GE/SEL. (Switzerland/Sweden/Germany/UK/USA/ France).	
2	Country of Origin (Place of Manufacturing)		(Switzerland/Sweden/Germany/UK/USA/ France)	
3	Relay Identification		Should be filled up by bidder	
3.1	Relay Type & model		Should be filled up by bidder	
3.2	Relay Software version		Should be filled up by bidder	
3.3	Relay Hardware version		Should be filled up by bidder	
4	Language		English	
5	Housing & mounting		Flush mounting housing and capable of sustaining in harsh environmental condition	
6	Relay auxiliary voltage	V	Minimum range of 88V to 250V DC and minimum range of 115V to 230V AC	
7	Operating frequency	Hz	50/60Hz, $\pm 5\%$	
8	Current transformer requirement			
8.1	No of Inputs	Nos	Min 4	
8.2	Nominal current	A	Operable in 1A and 5A	
8.3	Minimum continuous current capacity	A	3*Nominal current	
8.4	Thermal withstand capacity	A	100*Nominal current for at least 1s	
9	Voltage transformer requirement			
9.1	No of Inputs	Nos	Min 5 (For Line voltage and Bus voltages)	
9.2	Nominal voltage	V	110	
9.3	Minimum continuous withstand voltage	V	220	
10	Binary input module			
10.1	Minimum number of inputs	Nos	Min 32 (programmable) (Can be increased as per the scheme design)	
10.2	Minimum operating range	V	110V and 220V DC ($\pm 20\%$ tolerance)	
11	Binary output module			
11.1	Minimum number of outputs	Nos	Min 20 (minimum 5 Nos fast operating trip output and 1 Nos watchdog outputs) (Can be increased as per the scheme design)	
11.2	Minimum operating range	V	110V and 220V DC ($\pm 20\%$ tolerance)	
11.3	Minimum continuous current capacity	A	5	

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Attachment-6

No.	Description	Unit	Minimum Requirements	Guaranteed
			Data	
11.4	Short time withstand capacity	A	10A for at least 1s	
11.5	Maximum operating time	ms	10	
12	Number of LEDs	Nos	12 (programmable) (Can be increased as per the scheme design)	
13	HMI		Front mounted, should be suitable to issue close& open commands to switching devices through visual animation, access all functions, settings and stored records without external computer	
14	Software requirement		1. Should be able to configure, operate and monitor with user friendly engineering and disturbance handling tool. 2. Necessary software for configuration, disturbance handling and parameterization has to be supplied free of cost and without any time-bounded license.	
15	GPS Time synchronization		SNTP and IRIG-B	
16	Communication interface			
16.1	Standard protocol		IEC 61850 (have to be able to communicate to IEC 61850 base Substation Automation System)	
16.2	Ethernet speed and connector		100Mbps, RJ45 plug connector/RS232 serial connector as front port	
17	Protection function			
17.1	Main protection function		Instantaneous/delayed, directional/non-directional, over current and earth fault protection with IEC and ANSI/IEEE characteristics curves	
17.2	Number of parameter setting groups	Nos	Minimum 4 (Independently settable)	
17.3	Minimum stages in each setting groups for Over-current	Nos	3	
17.4	Minimum stages in each setting groups for Earth fault	Nos	3	
17.5	Pre-configuration		For all basic functions	
17.6	Tripping time		Settable between 0s to 150s	
17.7	Pick up setting range for Time delayed Directional/Non-directional OC	A	$0.1 \cdot I_n$ to at least $20 \cdot I_n$ (step size 0.01)	

No.	Description	Unit	Minimum Requirements	Guaranteed
			Data	
17.8	Pick up setting range for High set Directional/Non-directional OC	A	0.5*In to at least 35*In (step size 0.1)	
17.9	Pick up setting range for Time delayed Directional/Non-directional EF	A	0.01*In to at least 20*In (step size 0.01)	
17.10	Pick up setting range for High set Directional/Non-directional EF	A	0.5*In to at least 35*In (step size 0.1)	
17.12	TMS setting range for IDMT		0.025 to at least 1.5 (step size 0.025)	
17.13	Other protection functions		Comprehensive voltage protection functionality including over-voltage, under-voltage, negative sequence overvoltage and residual over-voltage protection	
18	Control functions		Synchrocheck Implementing interlocking logics Execution of close and open command for switching devices coming from SAS and Device HMI	
19	Monitoring functions			
19.1	U, I, P, Q, S, f, PF monitoring	Yes/No	Yes	
19.2	Event records and oscillographic disturbance records		Event recorder should keep at least 256 events and disturbance recorder should keep at least 20 2sec records. Disturbance recorder should handle at least 9 Nos analogue channels and at least 24 Nos binary channels	
20	Tripping and indication logics		Should be programmable	
21	Standards		Should conform IEC-60255 in all aspects	
22	Type test certificate		Should be provided	

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Schedule H: Drawings and Documents to Be Submitted with Bid

1.1 Drawing and Documents to be Submitted with BID

The following drawings/documents shall be submitted with the Tender:

1. Typical single line, layout & sectional drawings of substation showing details of construction and dimensions.
2. Outline drawings of all switchgear equipment:-
 - (a) Showing installed components, dimensions and weights;
 - (b) Showing transport dimensions and weights;
3. Outline drawings of all power transformers, auxiliary transformers and Shunt Reactor (if any):-
 - (a) Showing installed components, dimensions and weights;
 - (b) Showing transport dimensions and weights;
4. For furnishing Type Test Certificates of equipment, please see Volume 01 of 03 of the bidding document.

For each equipment, the Bidder shall provide the List of performed Type tests as following

Equipment					
No.	Type test	Name of Type test laboratory	Number of Type test report	Date of report	Number of pages

5. Quality Assurance Certificate ISO9001/9002 Certification (or equivalent) and Quality Assurance Programme & Typical Quality Plan for the work from the manufacturers of the following equipment:

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- (i) Power transformer
- (ii) GIS
- (iii) Switchgears (CB, DS/ES)
- (iv) Instrument Transformer
- (v) Relays & substation Automation System
- (vi) Fibre Optic Multiplexer Equipment for protection and communication
- (vii) GIL / Underground power cables
- (viii) Surge arrester
- (ix) Wave trap
- (x) Bus Reactor (N/A)
- (xi) DFDR
- (xii) Battery & charger
- (xiii) Insulator