

POWER GRID COMPANY OF BANGLADESH LIMITED

Design, Supply, Installation, Testing and Commissioning of 230/33kV GIS Substation at Char Fasson & 230kV GIS Bay Extension at Nutan Bidyut Power Plant on turnkey basis.

Under
Southwest Transmission Grid Expansion Project.

[Bid Identification No.: PGCB/ADB/3683/STGEP/CHARFASSON/SS]

Addendum No. 2

Volume 3 of 3

1. Bid form, prices & Schedule: (Schedule-A)

- i) The quantity of item no 2E2 is corrected to '1 lot' in place of '2 sets'.
Page No. [V3-SA-page 18 of 28]
- ii) The text "& each .4kV auxiliary feeders" has been removed from item 2H10
Page No. [V3-SA-page 19 of 28]

1. Schedule of Rates & Prices:

- i) The quantity of item no 2E.2 in Schedule No. 1, 2 & 4 is corrected to '1 lot' in place of '2 sets'.
Page No. [V3-SB-S1-page 7 of 22], [V3-SB-S2-page 7 of 21] & [V3-SB-S4-page 3 of 10]
- ii) The quantity of item no 2M4.3 in Schedule No. 4 is shall be to '1 lot'.
Page No. [V3-SB-S4-page 5 of 10]

The relevent revised pages Page No. [V3-SA-page 18 of 28-Rev.1], [V3-SA-page 19 of 28-Rev.1], [V3-SB-S1-page 7 of 22-Rev.1], [V3-SB-S2-page 7 of 21-Rev.1] & [V3-SB-S4-page 3 of 10-Rev.1] & [V3-SB-S4-page 5 of 10-Rev.1] are attached as **Annexure-1**.

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2E Power Transformers

- 2E1 Two (2) nos. of 230/34.5 kV, 120/140 MVA (ONAN/ONAF), Dyn1 three phase outdoor type transformers including all necessary connections, insulators & fittings. The Transformer shall have CTs of the following specification:

Item No	Requirements
HV BCT	800-400 A, 40kA/3s single phase, 3-core, current transformer with cores as follows: - 800-400/1 A, 30VA, Class 5P20 (all 3 phases) - 800-400/1 A, 30VA, Class 5P20 (all 3 phases) - To WTI (B-Φ) (ratio, burden & class will be as per manufacturer's design) Actual CT burden shall be determined by CT sizing calculation during execution stage
LV BCT	36kV, 3200-1600A, 40kA/3s single phase, 4-core, current transformer with cores as follows: - 3200-1600/1 A, 30VA, Class 5P20 (all 3 phases) - 3200-1600/1 A, 30VA, Class 5P20 (all 3 phases) - To WTI (B-Φ) (ratio, burden & class will be as per manufacturer's design) - To AVR (C-Φ) (ratio, burden & class will be as per manufacturer's design) Actual CT burden shall be determined by CT sizing calculation during execution stage
NCT	36kV, 3200-1600A, 40kA/3s single phase, 2-core, current transformer with cores as follows: - 3200-1600/1 A, 30VA, Class 5P20 - 3200-1600/1 A, 30VA, Class 5P20 Actual CT burden shall be determined by CT sizing calculation during execution stage

- 2E2 One (1) lot of complete design, supply, delivery, installation, testing and commissioning of Water Spray type Fire Protection System for 230/33kV Transformers.

**2F Neutral Earthing Equipment.
Deleted.****2G Earthing/Auxiliary transformers**

- 2G1 Two (2) Nos Auxiliary power transformer 33/0.415 kV, 300 kVA, Dyn11, ONAN, oil immersed, three phase, outdoor, with off-load tap changer; including all necessary connections & support structures. Characteristics of CTs will be defined during design & execution.

The auxiliary transformers' capacity shall be validated by calculation during execution stage; and if required, higher capacity transformer shall have to be provided within same price.

2H Control, Protection, Substation Automation & Metering**245kV Circuits**

The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of: -

- 2H1 Two (2) sets of Control, Monitoring, Protection & Substation Automation System including event recording function for line circuits - Nutan Bidyut 1&2.

30 May



Annexure-1

Schedules of Rates and Prices						
Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad						
Item	Description	Code ¹	Qty. (1)	Unit	Foreign Currency Unit Price ¹ CIP (2)	Total Price ¹ CIP (1) x (2)
2D6.3.2	_Gantry Column with double beam including nut&bolts		0	nos.		
2D6.3.3	_Gantry beam including nut&bolts		0	nos.		
2D6.3.4	_Equipment support structures including nut&bolts					
2D6.3.4.1	For 33kV incomer-					
2D6.3.4.1.1	Structure for LA, copper plate, cable termination		4	set		
2D6.3.4.1.2	VT		2	set		
2D6.3.4.1.3	DS/ES		4	set		
2D6.3.4.1.4	CT		2	set		
2D6.3.4.1.5	CB		2	set		
2D6.3.4.1.6	Marshalling Kiosk		2	set		
2D6.3.4.2	For 33kV auxiliary feeder-					
2D6.3.4.2.1	Structure for LA, copper plate, cable termination		2	set		
2D6.3.4.2.2	DS/ES with fuse		2	set		
2D6.3.5	_Cable tray including fitting, fixing accessories		1	lot		
2E	Power Transformers and Earthing/Auxiliary Transformers					
2E.1	230/33 kV, 120/140 MVA (ONAN/ONAF), Dyn1 three phase outdoor type transformers		2	nos.		
2E.2	Complete design, supply, delivery, installation, testing and commissioning of Water Spray type Fire Protection System for 230/33kV Transformers		1	lot		
2F	Neutral Earthing Equipment.					
	Deleted.					
2G	Earthing /Auxiliary transformers					
2G1	Auxiliary power transformer 33/0.415 kV, 300 kVA, Dyn11, ONAN, oil immersed, three phase, outdoor, with off-load tap changer, with single phase, 2-core current transformers in all bushings, including all necessary connections & support structures.		2	nos.		
2H	Control, Protection, Substation Automation and Metering					
	230kV Circuits					
2H1	Control, Monitoring, Protection & Substation Automation System including event recording function for line circuits - 230kV Nutan Bidyut 1&2		2	sets		

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Schedules of Rates and Prices							
Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Within the Employer's Country							
Item	Description	Qty. (1)	Unit	Foreign Currency (in.....)		Local Currency (in BDT)	
				EXW Unit Price ¹	EXW Total Price ¹	EXW Unit Price	EXW Total Price
				(2)	(1) x (2)	(3)	(1) x (3)
2D6.3.4.1.4	CT	2	set				
2D6.3.4.1.5	CB	2	set				
2D6.3.4.1.6	Marshalling Kiosk	2	set				
2D6.3.4.2	For 33kV auxiliary feeder-						
2D6.3.4.2.1	Structure for LA, copper plate, cable termination	2	set				
2D6.3.4.2.2	DS/ES with fuse	2	set				
2D6.3.5	Cable tray including fitting, fixing accessories	1	lot				
2E	Power Transformers and Earthing/Auxiliary Transformers						
2E.1	230/33 kV, 120/140 MVA (ONAN/ONAF), Dyn1 three phase outdoor type transformers	2	nos.				
2E.2	Complete design, supply, delivery, installation, testing and commissioning of Water Spray type Fire Protection System for 230/33kV Transformers	1	lot				
2F	Neutral Earthing Equipment.						
	Deleted.						
2G	Earthing /Auxiliary transformers						
2G1	Auxiliary power transformer 33/0.415 kV, 300 kVA, Dyn11, ONAN, oil immersed, three phase, outdoor, with off-load tap changer, with single phase, 2-core current transformers in all bushings, including all necessary connections & support structures.	2	nos.				
2H	Control, Protection, Substation Automation and Metering						
	230kV Circuits						
2H1	Control, Monitoring, Protection & Substation Automation System including event recording function for line circuits - 230kV Nutan Bidyut 1&2	2	sets				
2H2	Control, Monitoring, Protection & Substation Automation System including event recording function for 120/140MVA, 230/33kV, three phase, power transformer circuits including transformer tap changer control, fan control & AVR	2	sets				
2H3	Control, Monitoring, Protection & Substation Automation System including event recording function for 230kV bus coupler bays	1	sets				
2H4	Control, Monitoring, Protection & Substation Automation System including event recording function for 230kV bus section bays	0	sets				
2H5	Busbar protection system for 245kV system	1	lot				

Annexure-1

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Schedules of Rates and Prices							
Schedule No. 4. Installation and Other Services							
Item	Description	Qty.	Unit	Unit Price ¹		Total Price ¹	
				Foreign currency portion	Local currency portion	Foreign currency portion	Local currency portion
				(2)	(3)	(1) X (2)	(1) X (3)
2B9.1.2	Clamps & Connectors	1	lot				
2B9.2	Insulator & Fittings						
2B9.2.1	Insulator	1	lot				
2B9.2.2	Fittings	1	lot				
2B9.3	Steel structures & cable tray						
2B9.3.1	Gantry Column with single beam including nut&bolts	9	nos.				
2B9.3.2	Gantry Column with double beam including nut&bolts	0	nos.				
2B9.3.3	Gantry beam including nut&bolts	6	nos.				
2B9.3.4	Equipment support structures including nut&bolts						
2B9.3.4.1	LA	12	nos.				
2B9.3.5	Cable tray including fitting, fixing accessories	0	lot				
2C	145kV GIS Switchyard, structures & connections						
	Deleted.						
2D	36kV Switchgears and Connections with Auto Transformer & Earthing/ Auxiliary Transformers						
	36kV Air Insulated Switchgear (AIS)						
2D1	30kV rated voltage, 25kV(rms) continuous operating voltage at 50°C, 10kA nominal discharge current, 50Hz, gapless metal oxide type, single phase surge arresters with surge counters.	18	nos.				
2D2	Single-phase, 2-secondary windings (33,000/√3 / 110/√3 / 110/√3V, 30VA/30VA, Class 3P/0.2) 36kV, 40kA/3sec, 50Hz, 170kVp BIL, inductive voltage transformers	6	nos.				
2D3	36kV Disconnecter						
2D3.1	36kV, 2500A, 40kA/3sec, 50Hz, 170kVp BIL, single horizontal break, post type, disconnecter with earth switch (DS & ES both motor operated) for 36kV AIS incomer	4	sets				
2D3.2	36kV, 630A, 31.5kA/3sec, 50Hz, 170kVp BIL, single horizontal break, post type, disconnecter (motor operated) with fuse for 36/4kV auxiliary transformer bay	2	sets				
2D4	Current transformer 36 kV, single-phase, 4-cores (Core 1&2: 3200-1600/1A, Class: 5P20; Core 3&4: 3200-1600/1A, Class: 0.2S) 40 kA / 3 sec, 50 Hz, 170/70 kV BIL, post type current transformer.	6	nos.				
2D5	36kV, 2500A, 40kA/3sec, 50Hz, SF6/VCB circuit breaker with spring-stored energy operating mechanism	2	sets				
2D6	One (1) lot of stranded, flexible TACSR conductors, insulators, fittings, clamps, connectors, steel structures, cable trays, etc. including other accessories for each connection as required for completing 36kV AIS Switchyard and Transformer connections.						
2D6.1	Flexible Conductor, clamps & connectors for Jumper & equipment Connection, Copper bus	1	lot				
2D6.2	Insulator & Fittings	1	lot				
2D6.3	Steel structures & cable tray						
2D6.3.1	Gantry Column with single beam including nut&bolts	0	nos.				
2D6.3.2	Gantry Column with double beam including nut&bolts	0	nos.				
2D6.3.3	Gantry beam including nut&bolts	0	nos.				
2D6.3.4	Equipment support structures including nut&bolts						
2D6.3.4.1	For 33kV incomer-						
2D6.3.4.1.1	Structure for LA, copper plate, cable termination	4	set				
2D6.3.4.1.2	VT	2	set				
2D6.3.4.1.3	DS/ES	4	set				
2D6.3.4.1.4	CT	2	set				
2D6.3.4.1.5	CB	2	set				
2D6.3.4.1.6	Marshalling Kiosk	2	set				
2D6.3.4.2	For 33kV auxiliary feeder-						
2D6.3.4.2.1	Structure for LA, copper plate, cable termination	2	set				
2D6.3.4.2.2	DS/ES with fuse	2	set				
2D6.3.5	Cable tray including fitting, fixing accessories	1	lot				
2E	Power Transformers and Earthing/Auxiliary Transformers						
2E.1	230/33 kV, 120/140 MVA (ONAN/ONAF), Dyn1 three phase outdoor type transformers	2	nos.				
2E.2	Complete design, supply, delivery, installation, testing and commissioning of Water Spray type Fire Protection System for 230/33kV Transformers	1	lot				
2F	Neutral Earthing Equipment.						
	Deleted.						
2G	Earthing /Auxiliary transformers						
2G1	Auxiliary power transformer 33/0.415 kV, 300 kVA, Dyn11, ONAN, oil immersed, three phase, outdoor, with off-load tap changer; with single phase, 2-core current transformers in all bushings, including all necessary connections & support structures.	2	nos.				
2H	Control, Protection, Substation Automation and Metering						
	230kV Circuits						
2H1	Control, Monitoring, Protection & Substation Automation System including event recording function for line circuits - 230kV Nutan Bidyut 1&2	2	sets				

Schedules of Rates and Prices							
Schedule No. 4. Installation and Other Services							
Item	Description	Qty.	Unit	Unit Price ¹		Total Price ¹	
				Foreign currency portion	Local currency portion	Foreign currency portion	Local currency portion
				(2)	(3)	(1) X (2)	(1) X (3)
2M3.3.2.1	Structure for LA, copper plate, cable termination	2	set**				
2M3.3.2.2	DS/ES with fuse	2	set**				
2M3.4	Transformer foundation including oil pit for 230/33kV, 120/140MVA Transformer	2	nos.				
2M3.5	Blast wall for 230/33kV, 120/140MVA Transformer	2	nos.				
2M3.6	Transformer foundation for 300kVA auxiliary transformer	2	nos.				
2M3.7	Security boundary wall for overall plant	557	meter				
2M3.8	Substation main gate	2	nos.				
2M3.9	Chain link fencing with gates	309	meter				
2M3.10	Approach road (pavement width 6m)	42	meter				
2M3.11	Internal roads:						
2M3.11.1	6m wide road:	246	meter				
2M3.11.2	4.5m wide road	246	meter				
2M3.11.3	3m wide road	130	meter				
2M3.11.4	1.5m walk way	10	meter				
2M3.12	Cable Trench with soak pit						
2M3.12.1	For control cable of 33kV incomer AIS & 33kV power cable to auxiliary Tx.	190	meter				
2M3.12.2	For .4kV power cable from auxiliary Tx bay to GIS building	8	meter				
2M3.13	Surface drain around the substation	533	meter				
2M3.14	Whole substation surface finishing with drainage system including outlet & a network of water pits connected with pipes throughout the substation (excluding surface drain)	1	lot				
2M3.15	Gravel surfacing & gravel laying	2361	m ²				
2M3.16	Guard house	1	Nos				
2M3.17	Sentry post	2	Nos				
2M3.18	Open store yard including chain link fence, surface drain & gate	1	lot				
2M3.19	RCC box culvert	2	Nos				
2M3.20	Property line demarkation	685	meter				
2M3.21	Septic tank and soakpit	3	Nos				
2M3.22	Pump shed including deep tubewell, motor, pump, water reservoir, water pipe line, electrical connetion etc.	3	Nos				
2M3.23	Car port	1	Nos				
2M4.1	Complete civil works for 230kV indoor GIS building including protection & metering room, battery room etc. (3 STORIED)						
2M4.1.1	Foundation works	1	lot				
2M4.1.2	Super structures	1	lot				
2M4.1.3	All finish works like rendering, painting, water supply, sanitary, floor finish, furniture, etc.	1	lot				
2M4.1.4	Complete EOT crain system in GIS room (minimum 7 Ton)	1	lot				
2M4.1.5	Elevator system (capacity: minimum 6 people)	1	lot				
2M4.2	Complete civil works for Dormitory cum Indoor Store cum Staff Room (3 STORIED)						
2M4.2.1	Foundation works	1	lot				
2M4.2.2	Super structures	1	lot				
2M4.2.3	All finish works like rendering, painting, water supply, sanitary, floor finish, furniture, etc.	1	lot				
2M4.3	Complete civil works for Ansar Barack including foundations, super structures & all finish works like rendering, painting, water supply, sanitary, floor finish, furniture, etc. (1 STORIED)	1	lot				
2M5	Complete design, supply and construction of all civil items and facilities required for Water Spray type Fire Protection System for transformers	1	lot				
2M6	Complete design, supply and construction of all civil items and facilities required for Diesel Generator room	1	lot				
2M7	Testing of Foundation on random basis.						
2M7.1	Compression Test of pile	3	Nos				
2M7.2	Uplift Test of pile	1	Nos				
2M8	Fire alarm & fire fighting system for other areas	1	lot				
	* actual payment shall be as per actual work at site						
	** one set includes foundation for three phases of a circuit						
2N	Building Lighting, Small Power, Air Conditioning and Ventilation						
2N1	Complete design, supply, installation and commissioning of equipment to provide lighting, LV power supply, air conditioning system, ventilation system and emergency DC lighting for the substation GIS & Control room buildings, auxiliary & other houses (air cooling system shall be double of the actual requirement).	1	lot				
2N2	Complete equipment shall be designed, supplied, delivered, in-stalled, tested and commissioned of surveillance system with IP cameras, NVRs, optical fibre, cat6 cables, switches, indoor & outdoor cabinets, lightning protection systems, power cables and other accessories to complete surveillance system of the substation						
2N2.1	Bullet camera	24	Nos				
2N2.2	Dome camera	8	Nos				
2N2.3	32 channel NVR	1	Nos				
2N2.4	Access switch	1	lot				
2N2.5	Core switch	1	lot				
2N2.6	32" LED TV	1	Nos				

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- 2H2 Two (2) sets of Control, Monitoring, Protection & Substation Automation System including event recording function for 120/140MVA, 230/33kV, three phase, power transformer circuits including transformer tap changer control, fan control & AVR
- 2H3 One (1) sets of Control, Monitoring, Protection & Substation Automation System including event recording function coupler bays
- 2H4 Deleted.
- 2H5 One (1) lot of busbar protection system for 245kV system
- 2H6 One (1) lot of tariff metering panel to accommodate programmable & recordable digital 3-phase, 4 wire import and export MWh and MVARh meters (accuracy class 0.2) for each 230kV line and transformer feeders. For each feeder minimum two meters (main & check) including one set software and communication cord. Substation Automation System shall include monitoring of the metering for all the bays. Tariff Metering is to be supplied from Europe, USA or Japan origin or other countries with equivalent quality. Printed catalogue, operation and service manual are to be provided.
- 2H7 One (1) lot of independent standalone Digital Fault and Disturbance recorder (DFDR) to monitor complete substation including all bays for 245kV GIS, 230/33kV Transformer and 33kV AIS incomer.

33kV Circuits

The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of: -

- 2H8 Two (2) sets of Control, Monitoring, Protection & Substation Automation System including event recording function for two (2) sets of 33kV incomer circuits of 230/33kV transformer
- 2H9 Two (2) sets of Control, Monitoring & Substation Automation System including event recording function for two (2) sets of auxiliary transformer bays (includes both 33kV & .4kV side, for more details please see PSLD)
- 2H10 One (1) lot of tariff metering panel to accommodate programmable & recordable digital 3-phase, 4 wire import and export MWh and MVARh meters (accuracy class 0.2) for each 33kV transformer incomer feeders (For each 33kV incomer bays, one (1) tariff meter (main) including one set software and communication cord shall be provided with all necessary accessories. Space provision for another tariff meter (check) shall be kept for future). Tariff Metering is to be supplied from Europe, USA or Japan origin or other countries with equivalent quality. Printed catalogue, operation and service manual are to be provided.

Substation Automation System shall include monitoring of the metering for all the bays. Also, provision shall be kept for remote control from NLDC for at least 4 Nos 33kV outgoing feeders.

132kV Circuits

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