

Power Grid Company of Bangladesh Limited (PGCB)

Design, Supply, Installation, Testing & Commissioning of 230kV AIS Bay Extension at Parbatipur 230kV AIS

Switching Substation (Package-2, Lot-2)

Contract No.: PGCB/EXIM BANK/LOC-2/230kV/SS-PAR

IFB Ref. No.: 27.21.0000.101.07.241.21.449, Dated January 24, 2022

Clarification- 01

Pre Bid meeting was held on 07th February 2022 at 11:00 o'clock at the PGCB Headquarter.

All comments, queries and requests for clarification, regarding the Tender documents, received from prospective Bidders, and relevant replies and clarifications prepared by PGCB, and associated addendums (if any), are part of Tender documents

No.	Volume / Section / Clause / Item / Page	Bidder's comment / Query / Clarification	PGCB's Reply / Clarification	Add. Y/N
1.	General	As per our understanding, earthmat is required for proposed 2 no. of 230KV bays. Please confirm.	Main earthmat is present for this substation. Equipment earthing and other earthing connection needed for the two bay extensions shall be envisaged under this project's scope. Refer to attachment 1 of addendum-1.	

2..	Clause no 4.1, ITB	... Government of India vide letter No. 21/3/2015-IDEAS dated December 07, 2015 and the Public Procurement Order nos. 1 & 2 dated July 23, 2020 and Public Procurement Order no. 3 dated July 24, 2020 issued by the Public Procurement Division of the Department of Expenditure (DOE), Ministry of Finance, Government of India during implementation of procurement proceedings and the execution of Contracts under public funds.1 In pursuance of the policy.... We understand that as per our clause, sourcing of material is to be limited to the suppliers who are registered as per PPD of DOE; however, few suppliers are indicated in telecom specification who are not meeting the above requirement. Please advise that the all suppliers indicated in specifications are acceptable or not.	Your understanding is not correct. Clause ITB 4.1 is applicable for Fraudulent and corrupt practice related issues during the procurement process. Bidders are requested to read the bidding document carefully and shall follow the requirements of the bidding document	
3.	General	Please provide existing earthmat layout and earthmat spacing value for existing earthmat.	The earthing design will be based on the specifications given in Volume-2, Section-7 and is under contractor's scope.	
4.	General	Please provide soil resistivity value for earthmat sizing.	Bidder requested to visit sites and measure soil resistivity; it is in Bidder's scope.	
5.	General-LAYOUT PLAN	As per layout plan existing substation doesn't have SPR, we understand that in the existing control building, there is enough space for panels of 2 no. of 230kV bays. Please confirm.	Your understanding is correct.	
6.	Price schedule-1P.3. Lighting, small power, air conditioning and Ventilation- Extension of Lighting for outside building for security, roadway, switchyard and emergency DC lighting.	As per our understanding illumination is required only for switchyard area of 2nos. of bays. Please confirm.	Your understanding is correct.	

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7.	Price schedule-1B1.8 Flexible Conductor for jack/ jumper bus, equipment connections	Please provide conductor details and sizes.	As per tender requirement. Conductor details shall be finalized during execution stage.	
8.	Price schedule- 1F.2 Modification / Extension/Renovation of Busbar Protection	As per our understanding existing bus bar protection is to be augmented. Please confirm that the existing bus bar panel is enough to accommodate the proposed 2nos. Of 230kV bays.	Please follow bidding document.	
9.	Price schedule Vol 3 of 3- 1H.1 SCADA system for Telecontrol and Telemetering - One (01) set of Gateway (server, engineering software)- Deleted(as per price schedule)	As per vol 3, one no. of industrial gateway is required under scope of work for this project but there is conflict between price schedule and vol 3. We understand that there are already 2 nos. of gateways and no need of industrial gateway is required under this project. Please confirm our understanding.	Please follow price schedule.	
10.	Price schedule- 1M. Batteries, Chargers and DC Distribution	As per our understanding extension of 110V DCDB and 48V DCDB is under present scope of work. We presume that existing DCDB is enough to incorporate 2no. of bays.	Your understanding is correct.	
11.	Price schedule- 1N. LVAC Distribution	We presume that existing ACDB is enough to incorporate 2nos. Of bays.	Your understanding is correct.	
12.	Vol. 3 (Pg No.- 27)- 1F. Control, Protection, Substation Automation & Metering	We understand that existing SAS and protection is ABB, Switzerland make. Bidder scope is limited to integrate present scope bays to existing SAS. Please confirm. Also kindly provide the existing SAS architectural drawing if possible.	Refer to attachment 1 of addendum-1. Parbatipur 230kV SS is under scope of another project. SAS architectural drawing yet not finalized.	
13.	Vol 3 (Pg no- 27) - 1H. SCADA system for Telecontrol and Telemetering	We understand that bidder present scope is extension/modification of complete set of design, supply, delivery, installation, testing & commissioning of hardware and software to provide the telecontrol & telemetering facilities required at the existing National Load Despatch Center (NLDC) at Rampura and backup station at Biddyt Bhaban for integration of extension.	As per tender	

		sion of 230kV Parbatipur AIS substation. Kindly confirm that details (make and model) of existing NLDC at Rampura and backup station at Biddyt Bhaban		
14.	Vol 3 (Pg no- 28) - 11.1 Fibre Optic Multiplexer Equipment for Communication and Protection	We understand that extension of existing fibre optic multiplexer equipment at local and remote end Substation for protection & communication are under bidder scope. *Existing Telecom panels are from GE or ABB. Kindly confirm local end make is GE or ABB?	Refer to attachment 1, 2 & 3 of addendum-1	
15.	Price schedule- 1L. Earthing and Lightning Protection- Extension of Lightning Protection System for 400kV Switchyard	In price schedule "extension of lightning protection system for 400kV switchyard" is written, we understand that it's a typo. For 230kV extension switchyard, can we provide shield wire for lightning protection? Please confirm.	This is a typographical error. It will be replaced by "For 230kV extension switchyard"	
16.	Technical specification - 10A Buildings and Civil Engineering works, Cl. 10A.1.1, Scope of work - point (i) -page no 4 of 10	Survey & Soil Investigation In the referred clause, we understand that site surveying and soil investigation is in scope of work. Please confirm and if our understanding is correct may include the same in schedule 1M- Civil works, building and foundation. If above work is not in bidder scope, please provide the contour layout & soil investigation report.	As per tender	
17.	Technical specification - 10A Buildings and Civil Engineering works, Cl. 10A.1.1, Scope of work - point (ii) -page no 4 of 10	Cutting / Filling / Levelling the site We understand that site is already levelled. Please confirm it.	Please follow the bidding documents.	
18	General	If available, request you to furnish the existing substation foundation layout.	As per tender, Substation foundation will be based on the specifications given in Volume-2, Section-10 & 11 and is under contractor's scope.	

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19	Price Schedule-1, Clause no. 1P	As per Price Schedule, we understand that there is no scope of Fire Fighting System envisaged for this tender. Please confirm.	Your understanding is correct.	
20	Price Schedule-1, Clause no. 1P	As per Price Schedule, we understand that there is no scope of Air Conditioning & Ventilation System envisaged for this tender. Please confirm.	Your understanding is correct.	

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Addendum No. 01

Volume-3, Schedule-A:

1. Vol 03, Schedule A: Schedules of Requirements, Section-I: Parbatipur 230kV AIS Bay extension

Pages related to Clause no- 1B1.6, 1F, 1L.1 & 1I at Section-I: Parbatipur 230kV AIS Bay extension is revised and attached as attachement-01.

Volume-3, Schedule-B:

2. Vol 03, Schedule B, Price Schedule.

Pages related to Item no- 1I in the Price schedule is revised and attached as attachement-02

3. Vol 03, Schedule B, Price Schedule

Item no 1B1.6- Description of Equipment Requirement is revised as follows:

198kV rated voltage at 50°C 10kA nominal discharge current, 50Hz, Heavy duty station class, gapless metal oxide type, single phase surge arresters.

Volume-3, Schedule-E:

4. Vol 03, Schedule E, Clause 6.2: "230kV Surge Arrester" is revised and attached as attachement-04

Volume-2:

5. Vol 02, Section-18

Optical Communication Scheme drawing is added in the drawing at the end of section-18 as Drawing SI no 20.7 and attached as attachement-03



Attachement-01

- 1B1.6 Six (06) nos. of 198kV rated voltage at 50°C 10kA nominal discharge current, 50Hz, Heavy duty station class, gapless metal oxide type, single phase surge arresters.

1F Control, Protection, Substation Automation & Metering

1F.1	Control, Protection, Substation Automation System & Metering
	230 KV circuits
	The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of: -
1F.1	Control, Monitoring, Protection (Main-1 & Main-2 relay) & Substation Automation Facility including event recording function for two (02) sets of 230KV overhead line circuits bays. Main-1 & Main-2 relay shall from different manufacturer.
1F.2	One (1) Lot of renovation/extension of Busbar protection for 230kV system.
1F.3	One (01) lot of Tariff metering panel to accommodate programmable & recordable digital 3-phase, 4wire import and export MWh and MVarh meters (accuracy class 0.2) for each 230 kV line and transformer feeders. For each feeder minimum two meters (main & check) shall be supplied. Substation Automation System shall include the metering for all the bays. Printed catalogue, operation and service manual are to be provided. . If enough space is available in the existing metering panels, new metering panel may be omitted.
	Substation Automation System
1F.4	Extension of SAS including all required equipment & accessories excluding protection panel & relay for the whole Substation. SAS system shall include BCUs, Ethernet Switches, extension of alarm unit & software, panels, Cables etc. The SAS system shall be equipped with a common alarm unit to incorporate MCB's (DC/AC) status. The existing SAS's manufacturer at Parbatipur Substation will be Siemens, Germany .
1G	DFDR
1G.1	One (01) lot of modification/extension of Digital Fault and Disturbance recorder (DFDR) to monitor complete substation including newly added two (02) bays for 230kV GIS. Existing DFDR model will be Qualitrol make.

1I Telecommunication System, Fibre optic multiplexer equipment for communication and protection

1I	Fibre Optic Multiplexer Equipment for Communication and Protection
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11.1	One (01) complete lot of equipment for extension of existing fibre optic multiplexer equipment at local and remote end Substation for protection & communication, for required part of substation, shall be designed, supplied, delivered, installed, tested and commissioned and integrated into the existing system, under this contract. Fibre optic multiplexer equipment is to be provided for - <table border="1" data-bbox="296 405 1206 584"> <tr> <td>21 (or 87 with built-in 21) relay for each transmission line protection (through fibre cores or backup PLC)</td> </tr> <tr> <td>Distance relay carrier signal (main and back-up)</td> </tr> <tr> <td>SCADA data from switchgear and control system through SAS</td> </tr> <tr> <td>Hot-line telephone system</td> </tr> </table> The equipment to be supplied, installed and commissioned shall be as shown on bid drawing. Supply/Extension/Modification of Indoor Fibre Optic Multiplexer Equipment at local and remote end substations each comprising	21 (or 87 with built-in 21) relay for each transmission line protection (through fibre cores or backup PLC)	Distance relay carrier signal (main and back-up)	SCADA data from switchgear and control system through SAS	Hot-line telephone system
21 (or 87 with built-in 21) relay for each transmission line protection (through fibre cores or backup PLC)					
Distance relay carrier signal (main and back-up)					
SCADA data from switchgear and control system through SAS					
Hot-line telephone system					
	1) At Local and Remote End Substation- a) Modification of ADM with TP unit without booster each comprising i. One (01) set Duplicate CPU (if required) ii. One (01) set Duplicate PSU (if required) iii. Optical STM-16 ports for each direction of 400 kV line- N/A iv. One (01) lot of Optical STM-16/4 ports for each direction of 230 kV line v. Optical STM-4 ports for each direction of 132 kV line – N/A vi. One (01) set of 16x2 Mbps (E1) card (if required) vii. One (01) set of card with minimum Eight ports 10/100 Base T LAN (if required) viii. One (01) set of card with minimum Eight ports 10/100 Base T Router (if required) ix. One (01) set of card with 20x2-w voice for FXS (if required) x. One lot of Required no of cards with 24 commands for distance protection after detail design b) One (01) lot of Optical Booster (if required) c) One (01) set of IDF/SDF d) One (01) lot of Cables e) One (01) lot of EOW telephone with board (if required) f) One (01) lot of Panel including wiring, lighting, filtering fan, humidity controller, heater, power socket & other accessories (if required) g) Other accessories (if any) h) One(01) lot of Pigtail cables i) One (01) lot of ODF j) Incorporation of cyber security 2) Other Indoor equipment comprising of i. One (01) set of PABX Card (FXO) ii. Two (02) sets of Primary phone (IP phone) (if required) iii. Ten (10) sets of Secondary phone (2W phone) (required) iv. One (01) lot of Extension of MDF(if required)				

	Along with the above mentioned items if any additional items are needed in line with the Drawing SI No.: 20.7: "Proposed Optical Communication Scheme for Parbatipur-Bogura 230 KV Line", Volume 2 of 3 of the bidding documents, that shall be supplied and installed within contract price. No additional payment shall be made in this regard. *Existing Telecom panels shall be from ABB or GE.
11.2	A lot of Armoured Underground Optical Fibre (48 cores) cables from terminal box at gantry structure to MDF (Main distribution Frame) shall be designed, supplied, delivered, installed, tested and commissioned, including supply and installation of MDF and digital cables, for required part of substation each comprising of – i. One (01) lot of Underground optical fibre cable, armoured, 48 core ii. One (01) lot of Outdoor termination box
11.3	PLCC System:
	Deleted

11.1 One (1) lot extension of supply and installation of earthing system for outdoor switchyard equipment, Control Room with necessary connectors and clamps, with design to suit the extension work under this contract arrangement.

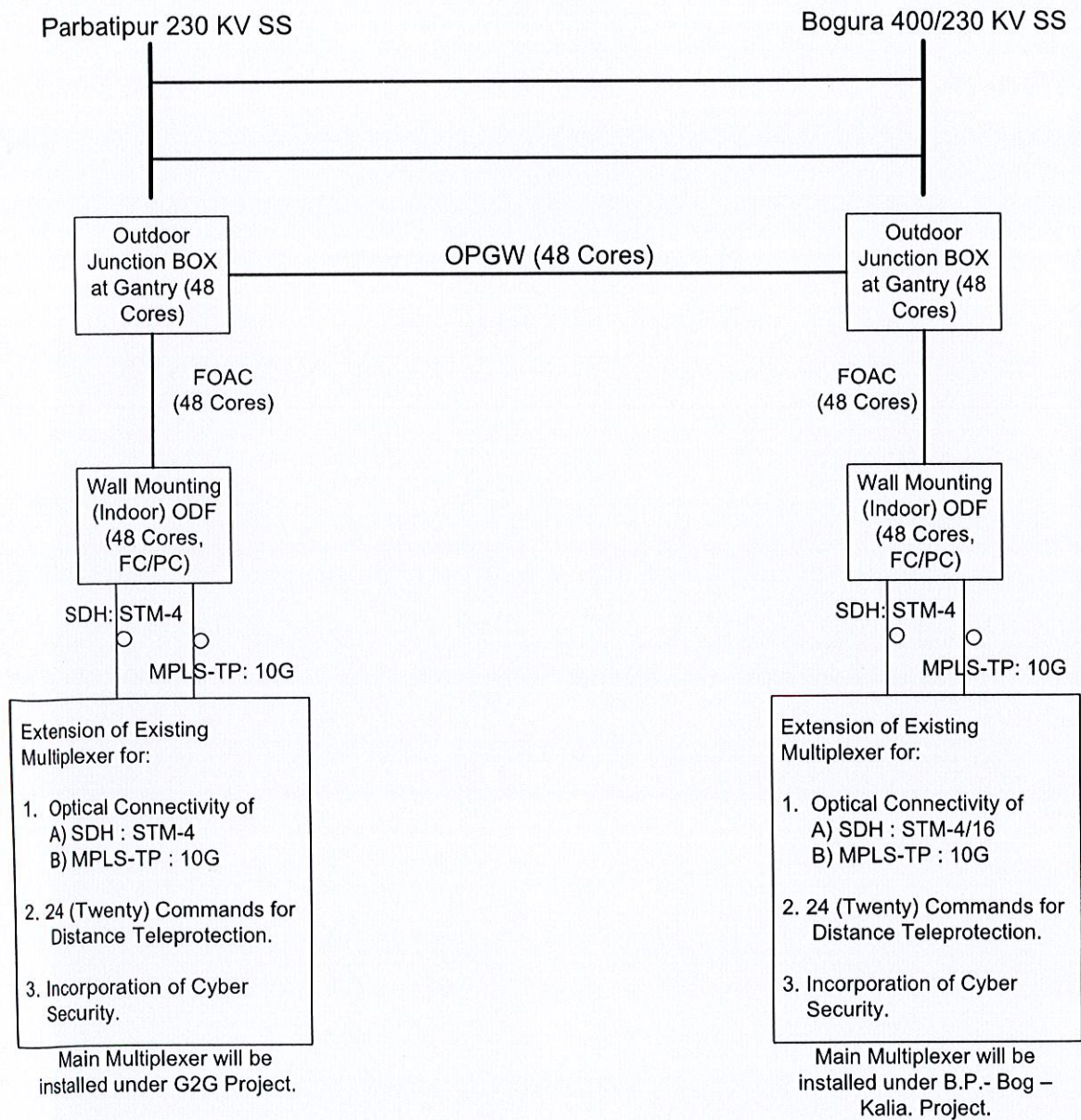
Attachement-02

11	Extension of Fibre Optic Multiplexer Equipment and PLC Equipment for Communication and Protection					
11.1	One (01) complete lot of equipment for extension of existing fibre optic multiplexer equipment at local and remote end Substation for protection & communication, for required part of substation, shall be designed, supplied, delivered, installed, tested and commissioned and integrated into the existing system, under this contract. Fibre optic multiplexer equipment is to be provided for - 21 (or 87 with built-in 21) relay for each transmission line protection (through fibre cores or backup PLC) Distance relay carrier signal (main and back-up) SCADA data from switchgear and control system through SAS Hot-line telephone system	Lot	1			
11.2	A lot of underground optical fibre (48 cores) cables from terminal box at gantry structure to MDF (Main distribution Frame) shall be designed, supplied, delivered, installed, tested and commissioned, including supply and installation of MDF and digital cables	Lot	1			
11.3	PLC equipment	Deleted				
11.4	Installation, testing & commissioning	refer to schedule B4				

Attachement-03

Drawing 20.7

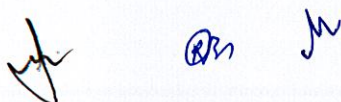
Proposed Optical Communication Scheme for Parbatipur-Bogura 230 KV Line (CKT- 3 & 4)



Attachement-04

230kV Surge Arrester:

No.	Description	Guaranteed		Guaranteed
		Unit	Data	
1	Surge Arresters - General			
1.1	Manufacturer		Insert	
1.2	Type		SM	
1.3	Model designation		Insert	
1.4	Country of origin		Insert	
1.5	Standards		IEC 60099-4	
1.6	Quality control		ISO 9001	
1.7	Design		Metal oxide, gapless, outdoor	
1.8	Short circuit testing authority		Insert authority	
1.9	Type Test Report Reference		Insert	
2	Surge Arresters - Characteristics			
2.1	Voltage			
2.1.1	Nominal System Voltage	kV rms	230	
2.1.2	Highest voltage for equipment Um	kV rms	245	
2.1.3	Rated voltage of surge arrester Ur	kV rms	198	
2.1.4	Max. continuous operating voltage Uc	kV rms	159	
2.1.5	Reference Voltage	KVrms		
2.1.6	Gap between Vref & MCOV	% of MCOV	Insert	
2.1.7	TOV [Curve to be attached]			
	0.1s	pu [of MCOV]	Insert	
	1s	pu [of MCOV]	Insert	
	3s	pu [of MCOV]	Insert	
	10s	pu [of MCOV]	Insert	
2.1.8	Maximum residual voltage Ures			
	For switching impulse current	kV	≤ 375	



No.	Description	Guaranteed		Guaranteed
		Unit	Data	
	30/60 μ s at 0,5 kA	peak		
	For switching impulse current 30/60 μ s at 1 kA	kV peak	≤ 385	
	For switching impulse current 30/60 μ s at 2 kA	kV peak	≤ 405	
	For lightning impulse current 8/20 μ s at 5 kA	kV peak	≤ 435	
	For lightning impulse current 8/20 μ s at 10 kA	kV peak	≤ 465	
	For lightning impulse current 8/20 μ s at 20 kA	kV peak	≤ 515	
2.1.9	Dielectric endurance of arrester housing			
	Lightning impulse withstand voltage of arrester housing up (1.2/50 μ s)	kV	Insert	
	Power frequency withstand voltage of arrester housing (1 min wet)	kV	Insert	
2.1.10	Arrester Protection Margin/level			
	Lightning Impulse Protection Margin/level		Min 2.2	
	Switching Impulse Protection Margin/level		Min 1.5	
	steep current impulse protection Margin/level		Min 2.0	
2.2	Current			
2.2.1	Reference Current	mA		
2.2.2	Long duration current impulse (2000 μ s)	A	≥ 850	
2.2.3	Nominal discharge current In (8/20 μ s)	kA peak	10	
2.2.4	High current impulse of an arrester (4/10 μ s)	kA peak	100	
2.3	Others			
2.3.1	Line discharge class	Class		
2.3.2	Energy dissipation capacity (per kV of rated voltage)	kJ/kV	≥ 7	
2.3.3	Thermal Charge Transfer Rating, Qth	Coulombs	Insert	
2.3.4	Repetitive Charge Transfer Rating, Qrs		Insert	
2.3.5	Rated frequency	Hz	Insert	
2.3.6	Partial Discharge Level	pC	≤ 10	
3	Surge Arresters - Design and Construction			
3.1	Designed Life	Years		

No.	Description	Guaranteed		Guaranteed
		Unit	Data	
3.2	MTBF		Insert	
3.3	MTTR		Insert	
3.4	Resistor Block			
3.4.1	Diameter	mm	Insert	
3.4.2	No. of ZnO Block in series at One unit	No.	Insert	
3.4.3	No. of separately housed arrester unit	No.		
3.4.4	Housing design			
	Open or Case Design Closed or Wrap Design Hollow Tube Design		Insert	
	Pressure relief device No. & Location			
	Highest pressure developed during rated discharge current	kPa		
	Highest pressure developed during rated pressure Relief Class	kPa		
	Alternate shed housing	Yes/No		
	Color of housing			
	Material of housing	SIR		
	Volcanizing Technology			
3.4.5	Design Considerations			
	Designed for Ambient Temperature	°C	-40 to +40	
	Solar Radiation	kW/m2	≥1.1	
	Altitude	m	1000	
	Frequency of AC Power Supply	Hz	48-62	
	Wind Velocity	m/s	≤ 34 m/s	
3.4.6	Similar Model that passed Short Circuit Test			
	100% fault current	kA	Insert	
	50% fault current	kA	Insert	
	25% fault current	kA	Insert	
3.6.	Mechanical requirements			
3.6.1	Specified short-term load SSL (Fdyn)	N	Insert	

No.	Description	Guaranteed		Guaranteed
		Unit	Data	
3.6.2	Specified long-term load SSL (Fstat)	N	Insert	
3.6.3	Maximum cantilever strength	Nm	Insert	
3.6.4	Maximum force due to wind (at maximum specified gust speed)	Nm	Insert	
3.7	Minimum creepage distance	mm/kV	≥ 25 mm/kV	
3.8.	Housing insulating material		Composite/ Silicon	
3.9	Insulating basement		Yes	
3.10	Surge arrester height	mm	Insert	
	Total leakage distance across outer insulator shedding for the complete arrester	mm		
	Protected leakage distance across outer insulator shedding for the complete arrester	mm		
	Clearance			
	phase to earth (from center line)	mm	Insert	
	phase to phase (center line to center line)	mm	Insert	
3.11	Surge arrester weight	kg	Insert	
3.12	Voltage distribution ring present	Yes/No	Yes	
3.12.1	Ring Diameter	mm		
3.14	HV terminal			
3.14.1	Shape		Flat	
3.14.2	Dimension	mm x mm	Min 100 x 100	
3.14.3	Number of holes		Min 4	
3.14.4	Distance between holes	mm x mm	50 x 50	
3.14.5	Material suitable for		Al terminal	
3.15	Arrester Grounding	Yes/No	Yes	
3.16	Surge Counter		Insert	
3.16.1	Manufacturer		Insert	
3.16.2	Type		Insert	
3.16.3	Model designation		Insert	
3.16.4	Country of origin		Insert	
3.16.5	Leakage Current Measurement			
3.16.5	Range of Measurement	uA-mA		
3.16.6	Sensitivity of surge counter peak at a wave shape of micro sec		Insert	

No.	Description	Guaranteed		Guaranteed
		Unit	Data	
3.16.7	Minimum counted Surge Ampere		Insert	
3.16.8	Error		Insert	
3.16.9	Grounding of Counter		Insert	
	Separate Insulated (from Counter housing) terminal at bottom of Counter		Insert	
	Separate Insulated (from Counter housing) terminal at top of Counter		Insert	
	Counter Body Earthing		Insert	
	Earthing Conductor Material		Copper	
	Conductor Size	mm2	Insert	
	Conductor Insulation		Insert	
3.16.10	Short Circuit Test of Counter		Yes	
3.16.10.1	Test Authority		Insert	
4	Drawings			
4.1	GA Drawing with All dimension & clearance clearly marked		Yes	
4.2	Sectional Drawing to show internal blocks, PRD etc.		Yes	
4.3	HV terminal Drawing		Yes	
4.4	Surge Counter Drawing		Yes	
4.5	Surge Counter installation Drawing		Yes	
4.6	Earthing Terminal Drawing		Yes	
4.7	Quality & FAT/Routine Test Plan Attached		Yes	
Overall compliance with the requirements (yes/no)				