

NEPAL ELECTRICITY AUTHORITY

(An Undertaking of Government of Nepal)
Project Management Directorate



PANGTAN 132 kV SUBSTATION PROJECT

*A component of
Electricity Grid Modernization Project*

BIDDING DOCUMENT FOR

**Procurement of Plant
for
Design, Supply, Installation, Testing and Commissioning of 132/33/11 kV Pangtan Substation
and associated bay extension works at Bahrabise Substation.
Single-Stage, Two-Envelope
Bidding Procedure**

Issued on:	19th April, 2021
Invitation for Bids No.:	PMD/PTDSSP/PSSP-77/78-01
OCB No.:	PMD/PTDSSP/PSSP-77/78-01
Employer:	Nepal Electricity Authority
Country:	Nepal

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**Pangtan 132 kV Substation Project
Project Management Directorate
Kharipati, Bhaktapur, Nepal
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NEPAL ELECTRICITY AUTHORITY
Project Management Directorate
Pangtan 132/33/11 kV Substation Project
Summary Sheet

F/C : Foreign Currency (USD)

L/C : Local Currency (NPR)

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

Grand Summary

S.No.	DESCRIPTION	Total amount	
		F/C	L/C
1	Schedule No.1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad		
	Pangtan Substation		
	Bahrabise Substation		
	Sub total of Schedule No. 1		
2	Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal		
	Pangtan Substation		
	Bahrabise Substation		
	Sub total of Schedule No. 2		
	SUB-TOTAL OF SUPPLY		
3	Schedule No.3: Design Services		
	Pangtan Substation		
	Bahrabise Substation		
	Sub total of Schedule No.3		
4	Schedule No.4:		
	a) Construction, Installation, Testing and Commissioning Services		
	Pangtan Substation		
	Bahrabise Substation		
	Sub total		
	b) Training Charges for training to be imparted abroad		
	Pangtan Substation		
	Bahrabise Substation		
	Sub total		
	c) Training Charges for training to be imparted in Nepal		
	Pangtan Substation		
	Bahrabise Substation		
	Sub total		
	d) Maintenance Charge		
	Pangtan Substation		
	Bahrabise Substation		
	Sub total		
	Sub total of Schedule No4		
	GRAND TOTAL Excluding Taxes & Customs [1+2+3+4(a)+4(b)+4(c) +4 (d)]		



NEPAL ELECTRICITY AUTHORITY
Project Management Directorate
Pangtan 132/33/11 kV Substation Project

F/C : Foreign Currency (USD)

L/C : Local Currency (NPR)

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

A. PANGTAN SUBSTATION**Summary**

S.No.	DESCRIPTION	TOTAL AMOUNT	
		F/C	L/C
1	Schedule No.1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, clearing, forwarding and transportation up to site.		
2	Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.		
	SUB-TOTAL OF SUPPLY		
3	Schedule No.3: Design Services		
4	Schedule No.4:		
	a) Construction, Installation, Testing and Commissioning Services		
	b) Training Charges for training to be imparted abroad		
	c) Training Charges for training to be imparted in Nepal		
	d) Maintenance Charge		
GRAND TOTAL Excluding Taxes & Customs [1+2+3+4(a)+4(b)+4(c) +4 (d)]		\$ -	₹ -

NEPAL ELECTRICITY AUTHORITY
Project Management Directorate
Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
		(1)	(2)	(3)	4=2*3	
A)	ELECTRICAL WORKS					
a)	POWER TRANSFORMER					
1	132/33 kV, Three Phase 24/27/30 MVA, ONAN/ONAF Power Transformer complete with On Load Tap Changer (OLTC) and RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides, star/star complete with all accessories as specified.	no	1			
2	33/11 kV Three phase 6/8 MVA, ONAN/ONAF Transformer complete with On Load Tap Changer (OLTC) and RTCC facility with Tank Mounted LA and HV and LV side Bushing CT on both sides complete with all accessories.	no	1			
b)	STATION SUPPLY					
1	300 kVA, 33/0.4 kV station service transformer with current limiting fuse, power cable and other accessories as required.	no	1			
c)	CIRCUIT BREAKER & SWITCHGEAR					
1	145 kV, 2000 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for bus coupler)	sets	1			
2	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV side of power transformer & 132 kV lines)	sets	3			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
3	36 kV, 2000 A, 25 kA, 1 sec, 3 phase, Vacuum circuit breaker for incomer complete with all accessories	sets	1			
4	36 kV, 1250 A, 25 kA, 1 sec, 3 phase, Vacuum circuit breaker complete with all accessories	sets	3			
d)	12 kV VCB SWITCHGEAR PANEL WITH ACCESSORIES AS PER SPECIFICATION					
1	12 kV Transformer incomer module (2000A) (IP-2) with all accessories as per specification	sets	1			
2	12 kV Line Module (1250A) (IP-1) with all accessories as per specification	sets	4			
3	12 kV PT Module (1250A) (IP-3) with all accessories as per specification	sets	1			
d)	DISCONNECTING SWITCHES:					
1	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch complete with all accessories as per specification.	sets	2			
2	145 kV, 2000 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	2			
3	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	10			
4	36 kV, 1250 A, 3 phase disconnecting switch with grounding switch complete with all accessories as per specification.	sets	2			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
5	36 kV, 1250 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	1			
6	36 kV, 800 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	4			
e)	INSTRUMENT TRANSFORMERS:					
1	145 kV, 50 VA, 132/√3/110/√3 kV, Class 0.5/3P Voltage Transformer complete with all accessories as per specification	nos	12			
2	145 kV, 30 VA 5 core current transformer for Line & Bus coupler complete with all accessories as per specification	nos	9			
3	145 kV, 30 VA 5 core current transformer for power transformer complete with all accessories as per specification	nos	3			
4	36 kV, 50 VA, 33/√3/110/√3 V potential transformer complete with all accessories as per specification	nos	9			
5	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification	nos	3			
6	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	3			
7	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	6			
f)	LIGHTNING ARRESTORS:					
1	120 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
2	30 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			
3	9 kV Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			
g)	CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)					
1	132/33 kV transformer control and relay panel complete with all accessories as per technical specifications (For HV and LV)	sets	1			
2	33/11 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1			
3	132 kV Bus bar/ Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1			
4	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	2			
5	33 kV line control and relay panel complete with all accessories as per technical specifications	sets	2			
h)	CONTROL AND POWER CABLES ETC.					
1	12 kV, 400 SQmm, single core XLPE power cable including termination joints for both ends with all accessories complete from LV side of 33/11 kV power transformer to indoor 11 kV switchgear room.	Meter	550			
2	12 kV, 240 SQmm, three core XLPE power cable armoured including termination joints for both ends , double pole structure and with all accessories complete for 4 Nos of outgoing feeders.	Meter	800			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
3	33 kV HT armored Copper Cable (1CX240 SQmm) for 2 nos of 33 kV feeder line along with accessories including flexible pipe and termination equipments and structure at both end	Meter	600			
4	Power Cables - (1.1 kV grade)					
4.1	Required size of Power/ Control copper cable for switchyard, control room and communication purpose and others if any to complete the work as per specification.	LS	1			
4.2	Required size of Power/ Control copper cable for staff quarter building parking shade, playing court as main supply and others if any to complete the work as per specification.	LS	1			
4.3	Cable glands, lugs etc for Power & Control cables	LS	1			
i)	Grounding					
1	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories to complete the specified scope of works	LS	1			
2	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
j)	BATTERIES AND BATTERY CHARGER					
1	Battery charger for 110 V battery complete with all accessories to complete the specified scope of works	Nos	1			
2	Battery charger for 48 V battery complete with all accessories to complete the specified scope of works	Nos	1			
3	110 V, 600 AH maintenance free lead acid sealed type battery complete with all accessories to complete the specified scope of works	sets	1			
4	48 V, 300 AH maintenance free lead acid sealed type battery complete with all accessories to complete the specified scope of works	sets	1			
k)	Bus post Insulator:					
1	132 kV Bus post insulators	nos	48			
2	33 kV Bus post insulators	nos	24			
l)	ERECTION & MISCELLANEOUS MATERIALS					
1	132 kV insulator strings, Disc insulator, hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower.	lot	1			
2	33 kV insulator strings, Disc insulator, hardware, clamp, connectors & accessories to complete the specified scope of works including for line pole.	lot	1			
3	Main Tubular bus, expansion joint including all other accessories required to complete 132 kV double bus-bar configuration	LS	1			
4	Main tubular bus (for 33 bus bar), brach bus bar (for 132 kV) including branch bus bar for 33 kV and other accessories required to complete the job	LS	1			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
5	ACSR "CARDINAL" conductors for 132kV switchyard with necessary hardware, clamps for connecting, with all accessories for substation works and connection between tower & gantry, complete as per the specified scope of works:	LS	1			
6	ACSR conductors for 33 kV switchyard with necessary hardware, clamps for connecting, with all accessories for substation works and for 33 kV overhead connections to the 33 kV lines at Pangtan and all other places as required to complete the specified scope of works:	LS	1			
7	33 kV distribution line Material for double circuit (13 mtr Galvanized Steel Tubular Pole, Conductor ACSR 'DOG', Insulators, galvanized cross arms, angle for bracing, spandle, bracing angle, flat strip, I & U bolt, nut & bolts etc) including stay set to complete the specified scope of the work as per NEA standards	KM	2			
8	Air conditioning System:					
8.1	Ceiling cassette type split AC unit of 3 TR capacities including ceiling cassette type for 132 kV control room	Nos	4			
8.2	High wall type split AC unit of 2 TR capacities for 11 kV switchgear room	Nos	3			
8.3	High wall type split AC unit of 1.5 TR capacities for communication, battery, office room and staff quarter building	Nos	10			
9	Fire Protection System (Portable Trolley Wheel mounted extinguishers)					
9.1	30 litre foam type	Nos	4			
9.2	4.5 kg CO ₂ type	Nos	9			
9.3	22.5 kg Dry Chemical Powder (DCP) type	Nos	4			
9.4	Smoke detection system	LS	1			
9.5	Fire detection and Alarm System for control room	LS	1			
10	Identification plate, danger notice etc	LS	1			
m)	LT Switchgear (As per Technical specification)					

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
1	400 V AC Main switchboard panel	Sets	1			
2	110 V DCDB	Sets	1			
3	48 V DCDB	Sets	1			
n)	Illumination System					
1	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery, along the approach road (with support where necessary), Staff quarter area etc as per technical specification	LS	1			
2	Emergency DC lighting system complete for switchyard, entrance and staff quarter area	Sets	12			
	SUB TOTAL OF ELECTRIC EQUIPMENTS					
B)	SUBSTATION AUTOMATION/ COMMUNICATION/ SCADA (Based on IEC 61850)					
a)	SUBSTATION AUTOMATION SYSTEM:					
1	Complete Substation automation system including hardware and software for the substation & remote control stations alongwith associated equipments for the followings as per Technical Specification.					
1.1	132 kV System	bays	4			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
1.2	33 kV System	bays	2			
1.3	11 kV System	bays	4			
2	Integration of all 132/33/11kV Bays at Pangtan SS under present scope with the SIEMENS (Power 7) SCADA system at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	lot	1			
3	COMMUNICATION					
3.1	Digital Protection Coupler	nos	4			
3.2 (A)	Telecommunication equipments for Pangtan S/S					
3.2.1.A	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)					
(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equiped to complete function as per requirement in specification excluding (ii) & (iii) below	Lot	1			
(ii)	Optical Interface Cards/ SFP					
(a)	L4.2 SFP	Nos.	2			
(iii)	Tributary cards					
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2			
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2			
3.2.2. A	Equipment Cabinets	No.	1			
3.2.3.A	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
3.2.4. A	FODP	Nos.	2			
3.2.5.A	Fiber Optic Approach Cable	km	1			
	SUB TOTAL OF COMMUNICATION & SAS EQUIPMENTS					
C)	CIVIL AND ARCHITECTURAL WORKS					
1	Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, gusset plates and all accessories: (For 132 and 33 kV side)					
1.1	132 kV take off gantry structures including bus bar support)	LS	1			
1.2	132 kV internal gantry structures including 132/33 kV transformer gantry structure (with bus bar support)	LS	1			
1.3	145 kV SF6 circuit breaker	sets	4			
1.4	145 kV disconnecting switch with earth switch	sets	2			
1.5	145 kV disconnecting switch without earth switch	sets	12			
1.6	132 kV voltage transformer	nos	12			
1.7	132 kV current transformer	nos	12			
1.8	120 kV surge arrestor	nos	9			
1.9	132 kV Bus post insulator	no.	48			
1.10	33 kV take off gantry structures	LS	1			
1.11	33 kV internal gantry structures	LS	1			
1.12	33 kV vacuum circuit breaker	sets	4			
1.13	33 kV disconnecting switch with earth switch	sets	2			
1.14	33 kV disconnecting switch without earth switch	sets	5			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
1.15	33 kV voltage transformer	nos	9			
1.16	33 kV current transformer	nos	12			
1.17	30 kV surge arrestor	nos	9			
1.18	33 kV Bus post insulator	no.	24			
1.19	Rail Structure for 132/33 and 33/11 Power Transformers including access from inter road (For transformer shifting)	LS	1			
1.20	Lightning/ Earth Mast	lot	1			
	SUB TOTAL OF STEEL STRUCTURES					
D)	SPARE PARTS					
1.0	Transformer					
a)	132/33 kV Transformer:					
1	OLTC motor with contactor	sets	1			
2	Cooler Fan with motor	nos	1			
3	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1			
4	Buchholz relay complete with contacts (Main tank)	sets	1			
5	Magnetic oil level gauge	nos	1			
6	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
7	Complete set of pressure relief device	set	1			
8	Phase and Neutral Bushing 1 No each for 132/33 kV Transformer .	sets	1			
9	36 kV Bushing with metal parts and gaskets and lifting tools	nos	1			
10	Spare insulating oil to be handed over to NEA after commissioning for O&M requirement including tank	KL	15			
b)	33/ 11 kV Transformer					
1	OLTC motor with contactor	sets	1			
2	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1			
3	Buchholz relay complete with contacts (Main tank)	sets	1			
4	Magnetic oil level gauge	nos	1			
5	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1			
6	Complete set of pressure relief device	set	1			
7	Phase and Neutral Bushing 1 No each for 33/11 kV Transformer .	nos	1			
8	11 kV Bushing with metal parts and gaskets and lifting tools	nos	1			
2.0	145 KV SF6 CIRCUIT BREAKER:					
2.1	Complete set of interrupting chamber	set	1			
2.2	Rubber gaskets, 'O' rings and seals for SF6 gas (1 No. of each type)	sets	1			
2.3	Trip coil assembly with resistor as applicable	sets	3			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
2.4	Closing coil assembly with resistor as applicable	sets	3			
2.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1			
2.6	Gas filling equipment with accessories	sets	1			
2.7	Motor for mechanism	nos	1			
2.8	Gas in sealed non returnable bottles, net	kgs	50			
3.0	33 KV VACUUM CIRCUIT BREAKER:					
3.1	Complete set of interrupting chamber	set	1			
3.2	Rubber gaskets, 'O' rings and seals (1 No. of each type)	sets	1			
3.3	Trip coil assembly with resistor as applicable	sets	3			
3.4	Closing coil assembly with resistor as applicable	sets	3			
3.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1			
3.6	Motor for mechanism	nos	1			
4.0	For 12 kV VCB Switchgears :					
4.1	Complete set of interrupting chamber	nos	1			
4.2	Tripping Coils	nos	2			
4.3	Closing Coils	nos	2			
4.4	Spring Charging Motor	set	1			
4.5	3 phase O/C relay with ground fault for 11 kV side	set	1			
4.6	Ammeter	nos	1			
4.7	Voltmeter	nos	1			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
4.8	KVA meter	nos	1			
4.9	11 kV CTs as in Outgoing Feeder	set	1			
4.10	Operating Handle	nos	1			
4.11	Indicating Lamp (100% of used)	set	1			
4.12	11 kV HT cable termination kit alongwith accessories for indoor	sets	3			
4.13	11 kV HT cable termination kit alongwith accessories for outdoor	sets	3			
5.0	145 KV ISOLATORS :					
5.1	Porcelain insulators	nos	3			
5.2	Main contact assemblies (one assembly)	sets	3			
5.3	Auxiliary contact assemblies (one assembly)	sets	3			
5.4	Interlocking coil	sets	2			
5.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1			
5.6	Limit switch and Aux. Switches for complete 3 phase equipment					
4.6.1	For isolator	sets	1			
4.6.2	For earth switch	sets	1			

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S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
6.0	33 KV ISOLATORS :					
6.1	Porcelain insulators	nos	3			
6.2	Main contact assemblies (one assembly)	sets	3			
6.3	Auxiliary contact assemblies (one assembly)	sets	3			
6.4	Interlocking coil	sets	2			
6.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1			
6.6	Limit switch and Aux. Switches for complete 3 phase equipment					
5.6.1	For isolator	sets	1			
5.6.2	For earth switch	sets	1			
7.0	145 KV Instrument Transformer:					
7.1	132 kV Current transformer (excluding support structure and common JB) for transformer	no	1			
7.2	132 kV Current transformer (excluding support structure and common JB) for line and bus coupler	no	2			
7.3	132kV, VT (excluding support structure/ common JB)	no	2			
7.4	33 kV Current transformer (excluding support structure and common JB)	no	3			
7.5	33 kV PT (excluding support structure/ common JB)	no	2			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
8.0	Surge Arrestors: (Outdoor)					
8.1	120 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	3			
8.2	30 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	3			
8.3	9 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	nos	3			
9.0	110 V Battery Chargers					
9.1	Set of Control Cards	sets	1			
9.2	Set of relays	sets	1			
9.3	Rectifier transformer	nos	1			
9.4	Thyristor/ Diode	sets	1			
9.5	Fuses of Thyristor with indicators	sets	6			
10.0	48 V Battery Chargers					
10.1	Set of Control Cards	sets	1			
10.2	Set of relays	sets	1			
10.3	Rectifier transformer	no	1			
10.4	Thyristor/ Diode	sets	1			
10.5	Fuses of Thyristor with indicators	sets	6			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
11.0	Relay & Protection (132 kV):					
11.1	Line Protection Panel					
11.1.1	Numerical distance relay (1 no. of each type)	set	1			
11.2	Transformer Protection Panel					
11.2.1	Transformer differential protection	no	1			
11.2.2	Restricted earth fault protection relay with non-linear resistor	no	1			
11.2.3	Directional over current & E/F Protection Relay	no	1			
11.3	COMMON SPARES					
11.3.1	Breaker failure relay	no	1			
11.3.2	Trip circuit supervision relay	nos	2			
11.3.3	Self reset trip relay (relay of each type)	set	1			
11.3.4	Hand reset trip relay (relay of each type)	set	1			
11.3.5	Timer relay (relay of each type)	set	1			
11.3.6	DC supervision relay (relay of each type)	set	1			
11.3.7	Flag relays (relay of each type)	set	1			
11.3.8	Auxiliary relays (relay of each type)	set	1			
11.3.9	Indicating lamps of each type	nos	50			
11.3.10	Fuse of each type (300 % of used)	lot	1			
11.3.11	Color caps of each color for indicating lamp	nos	30			
11.3.12	Ammeter	nos	2			
11.3.13	Voltmeter	nos	2			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
12.0	Relay & Protection (33 kV):					
12.1	Line Protection Panel					
12.1.1	Directional over current & E/F Protection Relay	set	1			
12.2	Transformer Protection Panel					
12.2.1	Transformer differential protection	no	1			
12.2.2	Restricted earth fault protection relay with non-linear resistor	no	1			
12.2.3	Directional over current & E/F Protection Relay	no	1			
12.3	COMMON SPARES					
12.3.1	Breaker failure relay	no	1			
12.3.2	Trip circuit supervision relay	nos	2			
12.3.3	Self reset trip relay (relay of each type)	set	1			
12.3.4	Hand reset trip relay (relay of each type)	set	1			
12.3.5	Timer relay (relay of each type)	set	1			
12.3.6	DC supervision relay (relay of each type)	set	1			
12.3.7	Flag relays (relay of each type)	set	1			
12.3.8	Auxiliary relays (relay of each type)	set	1			
12.3.9	Indicating lamps of each type	nos	10			
12.3.10	Fuse of each type	nos	10			
12.3.11	Color caps of each color for indicating lamp	nos	10			
12.3.12	Ammeter	nos	2			
12.3.13	Voltmeter	nos	2			

A. PANGTAN SUBSTAION**Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
13.0	Indoor Swtichgear (33 kV Switchgear):					
13.1	33 kV Vacuum Interrupter	nos	2			
13.2	Tripping Coils	nos	3			
13.3	Closing Coils	nos	3			
13.4	Spring Charging Motor	set	1			
13.5	Protection Relays:					
13.5.1	3 phase Overcurrent Relay, for 33 kV side one of each type	nos	1			
13.5.2	Ground Fault Relay, for 33 kV side, one of each type	nos	1			
13.6	Ammeter, Nos one of each rating	nos	1			
13.7	Voltmeter	nos	1			
13.8	Indicating lamps and fuses (100% of used type), Lot	LS	1			
13.9	33 kV HT cable termination kit alongwith accessories for indoor	sets	3			
13.10	33 kV HT cable termination kit alongwith accessories for outdoor	sets	3			

A. PANGTAN SUBSTAION

Price Schedule No. 1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
14.0	Bus post Insulators:					
14.1	132 kV	nos	10			
14.2	33 kV	nos	10			
15.0	Communication and SCADA:					
15.1	SDH (Cross Connect/control cards, optical base cards, power supply cards, management card)	each	1			
15.2	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2			
15.3	SFP L4.1	Nos.	2			
15.4	Digital Protection Coupler	Nos.	1			
16.0	Miscellaneous:					
16.1	5 Nos. Digital Multimeter, 2 Nos. Tong Tester, 2 Nos. 1 kV Insulation Tester, 1 No. 5 kV motor operated Insulation Tester, 1 No. , Two nos. foldable aluminum ladders, High Voltage Test Kit (80 kV), Transformer Oil Test Kit (Digital, 80 kV) & 1 No. Trimble C3 2" Total station as per specifications	lot	1			
	SUB TOTAL OF SPARE PARTS					
	TOTAL OF SCHEDULE 1					

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate

Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

A. PANGTAN SUBSTATION

Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
		(1)	(2)	(3)	4=2*3	
A)	ELECTRICAL WORKS					
a)	POWER TRANSFORMER					
1	132/33 kV, Three Phase 24/27/30 MVA, ONAN/ONAF Power Transformer complete with On Load Tap Changer (OLTC) and RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides, star/star complete with all accessories as specified.	no	1			
2	33/11 kV Three phase 6/8 MVA, ONAN/ONAF Transformer complete with On Load Tap Changer (OLTC) and RTCC facility with Tank Mounted LA and HV and LV side Bushing CT on both sides complete with all accessories.	no	1			
b)	STATION SUPPLY					
1	300 kVA, 33/0.4 kV station service transformer with current limiting fuse, power cable and other accessories as required.	no	1			
c)	CIRCUIT BREAKER & SWITCHGEAR					
1	145 kV, 2000 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for bus coupler)	sets	1			
2	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV side of power transformer & 132 kV lines)	sets	3			
3	36 kV, 2000 A, 25 kA, 1 sec, 3 phase, Vacuum circuit breaker for incomer complete with all accessories	sets	1			
4	36 kV, 1250 A, 25 kA, 1 sec, 3 phase, Vacuum circuit breaker complete with all accessories	sets	3			

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A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
d)	12 kV VCB SWITCHGEAR PANEL WITH ACCESSORIES AS PER SPECIFICATION					
1	12 kV Transformer incomer module (2000A) (IP-2) with all accessories as per specification	sets	1			
2	12 kV Line Module (1250A) (IP-1) with all accessories as per specification	sets	4			
3	12 kV PT Module (1250A) (IP-3) with all accessories as per specification	sets	1			
d)	DISCONNECTING SWITCHES:					
1	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch complete with all accessories as per specification.	sets	2			
2	145 kV, 2000 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	2			
3	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	10			
4	36 kV, 1250 A, 3 phase disconnecting switch with grounding switch complete with all accessories as per specification.	sets	2			
5	36 kV, 1250 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	1			
6	36 kV, 800 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	4			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
e)	INSTRUMENT TRANSFORMERS:					
1	145 kV, 50 VA, 132/√3/110/√3 kV, Class 0.5/3P Voltage Transformer complete with all accessories as per specification	nos	12			
2	145 kV, 30 VA 5 core current transformer for Line & Bus coupler complete with all accessories as per specification	nos	9			
3	145 kV, 30 VA 5 core current transformer for power transformer complete with all accessories as per specification	nos	3			
4	36 kV, 50 VA, 33/√3/110/√3 V potential transformer complete with all accessories as per specification	nos	9			
5	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification	nos	3			
6	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	3			
7	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	6			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
f)	LIGHTNING ARRESTORS:					
1	120 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			
2	30 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			
3	9 kV Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			
g)	CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)					
1	132/33 kV transformer control and relay panel complete with all accessories as per technical specifications (For HV and LV)	sets	1			
2	33/11 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1			
3	132 kV Bus bar/ Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1			
4	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	2			
5	33 kV line control and relay panel complete with all accessories as per technical specifications	sets	2			
h)	CONTROL AND POWER CABLES ETC.					
1	12 kV, 400 SQmm, single core XLPE power cable including termination joints for both ends with all accessories complete from LV side of 33/11 kV power transformer to indoor 11 kV switchgear room.	Meter	550			
2	12 kV, 240 SQmm, three core XLPE power cable armoured including termination joints for both ends , double pole structure and with all accessories complete for 4 Nos of outgoing feeders.	Meter	800			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
3	Power Cables - (1.1 kV grade)					
3.1	Required size of Power/ Control copper cable for switchyard, control room and communication purpose and others if any to complete the work as per specification.	LS	1			
3.2	Required size of Power/ Control copper cable for staff quarter building parking shade, playing court as main supply and others if any to complete the work as per specification.	LS	1			
3.3	Cable glands, lugs etc for Power & Control cables	LS	1			
i)	Grounding					
1	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories to complete the specified scope of works	LS	1			
2	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
j)	BATTERIES AND BATTERY CHARGER					
1	Battery charger for 110 V battery complete with all accessories to complete the specified scope of works	Nos	1			
2	Battery charger for 48 V battery complete with all accessories to complete the specified scope of works	Nos	1			
3	110 V, 600 AH maintenance free lead acid sealed type battery complete with all accessories to complete the specified scope of works	sets	1			
4	48 V, 300 AH maintenance free lead acid sealed type battery complete with all accessories to complete the specified scope of works	sets	1			
k)	Bus post Insulator:					
1	132 kV Bus post insulators	nos	48			
2	33 kV Bus post insulators	nos	24			
l)	ERECTION & MISCELLANEOUS MATERIALS					
1	132 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line tower.	lot	1			
2	132 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower	lot	1			
3	33 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line pole.	lot	1			
4	33 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line pole	lot	1			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
5	Main Tubular bus, expansion joint including all other accessories required to complete 132 kV double bus-bar configuration	LS	1			
6	Main tubular bus (for 33 bus bar), brach bus bar (for 132 kV) including branch bus bar for 33 kV and other accessories required to complete the job	LS	1			
7	ACSR conductors for 33 kV switchyard with necessary hardware, clamps for connecting, with all accessories for substation works and for 33 kV overhead connections to the 33 kV lines at Pangtan and all other places as required to complete the specified scope of works:	LS	1			
8	33 kV distribution line Material for double circuit (13 mtr Galvanized Steel Tubular Pole, Conductor ACSR 'DOG', Insulators, galvanized cross arms, angle for bracing, spandle, bracing angle, flat strip, I & U bolt, nut & bolts etc) including stay set to complete the specified scope of the work as per NEA standards	KM	2			
9	Air conditioning System:					
9.1	Ceiling cassette type split AC unit of 3 TR capacities including ceiling cassette type for 132 kV control room	Nos	4			
9.2	High wall type split AC unit of 2 TR capacities for 11 kV switchgear room	Nos	3			
9.3	High wall type split AC unit of 1.5 TR capacities for communication, battery, office room and staff quarter building	Nos	10			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
9	Fire Protection System (Portable Trolley Wheel mounted extinguishers)					
9.1	30 litre foam type	Nos	4			
9.2	4.5 kg CO ₂ type	Nos	9			
9.3	22.5 kg Dry Chemical Powder (DCP) type	Nos	4			
9.4	Smoke detection system	LS	1			
9.5	Fire detection and Alarm System for control room	LS	1			
10	Identification plate, danger notice etc	LS	1			
m)	LT Switchgear (As per Technical specification)					
1	400 V AC Main switchboard panel	Sets	1			
2	110 V DCDB	Sets	1			
3	48 V DCDB	Sets	1			
n)	Illumination System					
1	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery (with support if necessary), Staff quarter area etc as per technical specification	LS	1			
2	Emergency DC lighting system complete for switchyard, entrance and staff quarter area	Nos	12			
	SUB TOTAL OF ELECTRIC EQUIPMENTS					

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
B)	<i>SUBSTATION AUTOMATION/ COMMUNICATION/ SCADA (Based on IEC 61850)</i>					
a)	SUBSTATION AUTOMATION SYSTEM:					
1	Complete Substation automation system including hardware and software for the substation & remote control stations alongwith associated equipments for the followings as per Technical Specification.					
1.1	132 kV System	bays	4			
1.2	33 kV System	bays	2			
1.3	11 kV System	bays	4			
2	Integration of all 132/33/11kV Bays at Pangtan SS under present scope with the SIEMENS (Power 7) SCADA system at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	lot	1			
3	Integration of all 132 kV Bays at Bahrabise SS under present scope with the SIEMENS (Power 7) SCADA system at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	Lot	1			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
4	COMMUNICATION					
4.1	Digital Protection Coupler	nos	4			
4.2 (A)	Telecommunication equipments for Pangtan S/S					
3.2.1.A	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)					
(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equiped to complete function as per requirement in specification excluding (ii) & (iii) below	Lot	1			
(ii)	Optical Interface Cards/ SFP					
(a)	L4.2 SFP	Nos.	2			
(iii)	Tributary cards					
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2			
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2			
3.2.2. A	Equipment Cabinets	No.	1			
3.2.3.A	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2			
3.2.4. A	FODP	Nos.	2			
3.2.5.A	Fiber Optic Approach Cable	km	1			
	SUB TOTAL OF COMMUNICATION & SAS EQUIPMENTS					

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
C)	CIVIL AND ARCHITECTURAL WORKS					
1	Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, gusset plates and all accessories: (For 132 and 33 kV side)					
1.1	132 kV take off gantry structures including bus bar support)	LS	1			
1.2	132 kV internal gantry structures including 132/33 kV transformer gantry structure (with bus bar support)	LS	1			
1.3	145 kV SF6 circuit breaker	sets	4			
1.4	145 kV disconnecting switch with earth switch	sets	2			
1.5	145 kV disconnecting switch without earth switch	sets	12			
1.6	132 kV voltage transformer	nos	12			
1.7	132 kV current transformer	nos	12			
1.8	120 kV surge arrestor	nos	9			
1.9	132 kV Bus post insulator	no.	48			
1.10	33 kV take off gantry structures	LS	1			
1.11	33 kV internal gantry structures	LS	1			
1.12	36 kV vacuum circuit breaker	sets	4			
1.13	33 kV disconnecting switch with earth switch	sets	2			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
1.14	33 kV disconnecting switch without earth switch	sets	5			
1.15	33 kV voltage transformer	nos	9			
1.16	33 kV current transformer	nos	12			
1.17	30 kV surge arrestor	nos	9			
1.18	33 kV Bus post insulator	no.	24			
1.19	Rail Structure for 132/33 and 33/11 Power Transformers including access from inter road (For transformer shifting)	LS	1			
1.20	Lightning/ Earth Mast	lot	1			
	SUB TOTAL OF CIVIL AND ARCHITECTURAL WORKS					
D)	SPARE PARTS					
1.0	Transformer					
a)	132/33 kV Transformer:					
1	OLTC motor with contactor	sets	1			
2	Cooler Fan with motor	nos	1			
3	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1			
4	Buchholz relay complete with contacts (Main tank)	sets	1			
5	Magnetic oil level gauge	nos	1			
6	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1			
7	Complete set of pressure relief device	set	1			
8	Phase and Neutral Bushing 1 No each for 132/33 kV Transformer .	sets	1			
9	36 kV Bushing with metal parts and gaskets and lifting tools	nos	1			
10	Spare insulating oil to be handed over to NEA after commissioning for O&M requirement including tank	KL	15			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
b)	33/ 11 kV Transformer					
1	OLTC motor with contactor	sets	1			
2	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1			
3	Buchholz relay complete with contacts (Main tank)	sets	1			
4	Magnetic oil level gauge	nos	1			
5	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1			
6	Complete set of pressure relief device	set	1			
7	Phase and Neutral Bushing 1 No each for 33/11 kV Transformer .	nos	1			
8	11 kV Bushing with metal parts and gaskets and lifting tools	nos	1			
2.0	145 KV SF6 CIRCUIT BREAKER:					
2.1	Complete set of interrupting chamber	set	1			
2.2	Rubber gaskets, 'O' rings and seals for SF6 gas (1 No. of each type)	sets	1			
2.3	Trip coil assembly with resistor as applicable	sets	3			
2.4	Closing coil assembly with resistor as applicable	sets	3			
2.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1			
2.6	Gas filling equipment with accessories	sets	1			
2.7	Motor for mechanism	nos	1			
2.8	Gas in sealed non returnable bottles, net	kgs	50			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
3.0	33 KV VACUUM CIRCUIT BREAKER:					
3.1	Complete set of interrupting chamber	set	1			
3.2	Rubber gaskets, 'O' rings and seals (1 No. of each type)	sets	1			
3.3	Trip coil assembly with resistor as applicable	sets	3			
3.4	Closing coil assembly with resistor as applicable	sets	3			
3.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1			
3.6	Motor for mechanism	nos	1			
4.0	For 12 kV VCB Switchgears :					
4.1	Complete set of interrupting chamber	nos	1			
4.2	Tripping Coils	nos	2			
4.3	Closing Coils	nos	2			
4.4	Spring Charging Motor	set	1			
4.5	3 phase O/C relay with ground fault for 11 kV side	set	1			
4.6	Ammeter	nos	1			
4.7	Voltmeter	nos	1			
4.8	KVA meter	nos	1			
4.9	11 kV CTs as in Outgoing Feeder	set	1			
4.10	Operating Handle	nos	1			
4.11	Indicating Lamp (100% of used)	set	1			
4.12	11 kV HT cable termination kit alongwith accessories for indoor	sets	3			
4.13	11 kV HT cable termination kit alongwith accessories for outdoor	sets	3			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
4.0	145 KV ISOLATORS :					
4.1	Porcelain insulators	nos	3			
4.2	Main contact assemblies (one assembly)	sets	3			
4.3	Auxiliary contact assemblies (one assembly)	sets	3			
4.4	Interlocking coil	sets	2			
4.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1			
4.6	Limit switch and Aux. Switches for complete 3 phase equipment					
4.6.1	For isolator	sets	1			
4.6.2	For earth switch	sets	1			
5.0	33 KV ISOLATORS :					
5.1	Porcelain insulators	nos	3			
5.2	Main contact assemblies (one assembly)	sets	3			
5.3	Auxiliary contact assemblies (one assembly)	sets	3			
5.4	Interlocking coil	sets	2			
5.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1			
5.6	Limit switch and Aux. Switches for complete 3 phase equipment					
5.6.1	For isolator	sets	1			
5.6.2	For earth switch	sets	1			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
6.0	145 KV Instrument Transformer:					
6.1	132 kV Current transformer (excluding support structure and common JB) for transformer	no	1			
6.2	132 kV Current transformer (excluding support structure and common JB) for line and bus coupler	no	2			
6.3	132kV, VT (excluding support structure/ common JB)	no	2			
6.4	33 kV Current transformer (excluding support structure and common JB)	no	3			
6.5	33 kV PT (excluding support structure/ common JB)	no	2			
7.0	Surge Arrestors: (Outdoor)					
7.1	120 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	3			
7.2	30 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	3			
7.3	9 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	nos	3			
8.0	110 V Battery Chargers					
8.1	Set of Control Cards	sets	1			
8.2	Set of relays	sets	1			
8.3	Rectifier transformer	nos	1			
8.4	Thyristor/ Diode	sets	1			
8.5	Fuses of Thyristor with indicators	sets	6			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
9.0	48 V Battery Chargers					
9.1	Set of Control Cards	sets	1			
9.2	Set of relays	sets	1			
9.3	Rectifier transformer	no	1			
9.4	Thyristor/ Diode	sets	1			
9.5	Fuses of Thyristor with indicators	sets	6			
10.0	Relay & Protection (132 kV):					
10.1	Line Protection Panel					
10.1.1	Numerical distance relay (1 no. of each type)	set	1			
10.2	Transformer Protection Panel					
10.2.1	Transformer differential protection	no	1			
10.2.2	Restricted earth fault protection relay with non-linear resistor	no	1			
10.2.3	Directional over current & E/F Protection Relay	no	1			
10.3	COMMON SPARES					
10.3.1	Breaker failure relay	no	1			
10.3.2	Trip circuit supervision relay	nos	2			
10.3.3	Self reset trip relay (relay of each type)	set	1			
10.3.4	Hand reset trip relay (relay of each type)	set	1			
10.3.5	Timer relay (relay of each type)	set	1			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
10.3.6	DC supervision relay (relay of each type)	set	1			
10.3.7	Flag relays (relay of each type)	set	1			
10.3.8	Auxiliary relays (relay of each type)	set	1			
10.3.9	Indicating lamps of each type	nos	50			
10.3.10	Fuse of each type (300 % of used)	lot	1			
10.3.11	Color caps of each color for indicating lamp	nos	30			
10.3.12	Ammeter	nos	2			
10.3.13	Voltmeter	nos	2			
11.0	Relay & Protection (33 kV):					
11.1	Line Protection Panel					
11.1.1	Directional over current & E/F Protection Relay	set	1			
11.2	Transformer Protection Panel					
11.2.1	Transformer differential protection	no	1			
11.2.2	Restricted earth fault protection relay with non-linear resistor	no	1			
11.2.3	Directional over current & E/F Protection Relay	no	1			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
11.3	COMMON SPARES					
11.3.1	Breaker failure relay	no	1			
11.3.2	Trip circuit supervision relay	nos	2			
11.3.3	Self reset trip relay (relay of each type)	set	1			
11.3.4	Hand reset trip relay (relay of each type)	set	1			
11.3.5	Timer relay (relay of each type)	set	1			
11.3.6	DC supervision relay (relay of each type)	set	1			
11.3.7	Flag relays (relay of each type)	set	1			
11.3.8	Auxiliary relays (relay of each type)	set	1			
11.3.9	Indicating lamps of each type	nos	10			
11.3.10	Fuse of each type	nos	10			
11.3.11	Color caps of each color for indicating lamp	nos	10			
11.3.12	Ammeter	nos	2			
11.3.13	Voltmeter	nos	2			
12.0	Indoor Switchgear (33 kV Switchgear):					
12.1	33 kV Vacuum Interrupter	nos	2			
12.2	Tripping Coils	nos	3			
12.3	Closing Coils	nos	3			
12.4	Spring Charging Motor	set	1			

A. PANGTAN SUBSTATION**Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.**

S. No.	Item Description	Estimated		Unit Rate in US \$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (including Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
12.5	Protection Relays:					
12.5.1	3 phase Overcurrent Relay, for 33 kV side one of each type	nos	1			
12.5.2	Ground Fault Relay, for 33 kV side, one of each type	nos	1			
12.6	Ammeter, Nos one of each rating	nos	1			
12.7	Voltmeter	nos	1			
12.8	Indicating lamps and fuses (100% of used type), Lot	LS	1			
12.9	33 kV HT cable termination kit alongwith accessories for indoor	sets	3			
12.10	33 kV HT cable termination kit alongwith accessories for outdoor	sets	3			
13.0	Bus post Insulators:					
13.1	132 kV	nos	10			
13.2	33 kV	nos	10			
14.0	Communication and SCADA:					
14.1	SDH (Cross Connect/control cards, optical base cards, power supply cards, management card)	each	1			
14.2	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2			
14.3	SFP L4.1	Nos.	2			
14.4	Digital Protection Coupler	Nos.	1			
15.0	Miscellaneous:					
15.1	5 Nos. Digital Multimeter, 2 Nos. Tong Tester, 2 Nos. 1 kV Insulation Tester, 1 No. 5 kV motor operated Insulation Tester, 1 No. High Voltage Test Kit (80 kV), Transformer Oil Test Kit (Digital, 80 kV) & 1 No. Trimble C3 2" Total station as per specifications	lot	1			
	SUB TOTAL OF SPARE PARTS				-	
	TOTAL OF SCHEDULE 2				-	

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

A. PANGTAN SUBSTATION

S. No.	Description	Item for which training is to be imparted.	Country where training is to be imparted	US \$	Total Amount US \$	Remarks
		1	2	3	4	
A	NOT APPLICABLE					

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate

Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

A. PANGTAN SUBSTATION

Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
		(1)	(2)	(3)	4=2*3	
A)	ELECTRICAL WORKS					
a)	POWER TRANSFORMER					
1	132/33 kV, Three Phase 24/27/30 MVA, ONAN/ONAF Power Transformer complete with On Load Tap Changer (OLTC) and RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides, star/star complete with all accessories as specified.	no	1			
2	33/11 kV Three phase 6/8 MVA, ONAN/ONAF Transformer complete with On Load Tap Changer (OLTC) and RTCC facility with Tank Mounted LA and HV and LV side Bushing CT on both sides complete with all accessories.	no	1			
b)	STATION SUPPLY					
1	300 kVA, 33/0.4 kV station service transformer with current limiting fuse, power cable and other accessories as required.	no	1			
c)	CIRCUIT BREAKER & SWITCHGEAR					
1	145 kV, 2000 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for bus coupler)	sets	1			
2	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV side of power transformer & 132 kV lines)	sets	3			
3	36 kV, 2000 A, 25 kA, 1 sec, 3 phase, Vacuum circuit breaker for incomer complete with all accessories	sets	1			
4	36 kV, 1250 A, 25 kA, 1 sec, 3 phase, Vacuum circuit breaker complete with all accessories	sets	3			

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A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
d)	12 kV VCB SWITCHGEAR PANEL WITH ACCESSORIES AS PER SPECIFICATION					
1	12 kV Transformer incomer module (2000A) (IP-2) with all accessories as per specification	sets	1			
2	12 kV Line Module (1250A) (IP-1) with all accessories as per specification	sets	4			
3	12 kV PT Module (1250A) (IP-3) with all accessories as per specification	sets	1			
d)	DISCONNECTING SWITCHES:					
1	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch complete with all accessories as per specification.	sets	2			
2	145 kV, 2000 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	2			
3	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	10			
4	36 kV, 1250 A, 3 phase disconnecting switch with grounding switch complete with all accessories as per specification.	sets	2			
5	36 kV, 1250 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	1			
6	36 kV, 800 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	4			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
e)	INSTRUMENT TRANSFORMERS:					
1	145 kV, 50 VA, 132/√3/110/√3 kV, Class 0.5/3P Voltage Transformer complete with all accessories as per specification	nos	12			
2	145 kV, 30 VA 5 core current transformer for Line & Bus coupler complete with all accessories as per specification	nos	9			
3	145 kV, 30 VA 5 core current transformer for power transformer complete with all accessories as per specification	nos	3			
4	36 kV, 50 VA, 33/√3/110/√3 V potential transformer complete with all accessories as per specification	nos	9			
5	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification	nos	3			
6	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	3			
7	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	6			
f)	LIGHTNING ARRESTORS:					
1	120 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			
2	30 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			
3	9 kV Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	9			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
g)	CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)					
1	132/33 kV transformer control and relay panel complete with all accessories as per technical specifications (For HV and LV)	sets	1			
2	33/11 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1			
3	132 kV Bus bar/ Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1			
4	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	2			
5	33 kV line control and relay panel complete with all accessories as per technical specifications	sets	2			
h)	CONTROL AND POWER CABLES ETC.					
1	12 kV, 400 SQmm, single core XLPE power cable including termination joints for both ends with all accessories complete from LV side of 33/11 kV power transformer to indoor 11 kV switchgear room.	Meter	550			
2	12 kV, 240 SQmm, three core XLPE power cable armoured including termination joints for both ends , double pole structure and with all accessories complete for 4 Nos of outgoing feeders.	Meter	800			
3	33 kV HT armoured Copper Cable (1CX240 SQmm) for 2 nos of 33 kV feeder line along with accessories including flexible pipe and termination equipments and structure at both end	Meter	600			
3	Power Cables - (1.1 kV grade)					
3.1	Required size of Power/ Control copper cable for switchyard, control room and communication purpose and others if any to complete the work as per specification.	LS	1			
3.2	Required size of Power/ Control copper cable for staff quarter building parking shade, playing court as main supply and others if any to complete the work as per specification.	LS	1			
3.3	Cable glands, lugs etc for Power & Control cables	LS	1			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
i)	Grounding					
1	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories to complete the specified scope of works	LS	1			
2	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1			
j)	BATTERIES AND BATTERY CHARGER					
1	Battery charger for 110 V battery complete with all accessories to complete the specified scope of works	Nos	1			
2	Battery charger for 48 V battery complete with all accessories to complete the specified scope of works	Nos	1			
3	110 V, 600 AH maintenance free lead acid sealed type battery complete with all accessories to complete the specified scope of works	sets	1			
4	48 V, 300 AH maintenance free lead acid sealed type battery complete with all accessories to complete the specified scope of works	sets	1			
k)	Bus post Insulator:					
1	132 kV Bus post insulators	nos	48			
2	33 kV Bus post insulators	nos	24			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
1)	ERECTION & MISCELLANEOUS MATERIALS					
1	132 kV insulator strings, Disc insulator, hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower.	lot	1			
2	33 kV insulator strings, Disc insulator, hardware, clamp, connectors & accessories to complete the specified scope of works including for line pole.	lot	1			
3	Main Tubular bus, expansion joint including all other accessories required to complete 132 kV double bus-bar configuration	LS	1			
4	Main tubular bus (for 33 bus bar), brach bus bar (for 132 kV) including branch bus bar for 33 kV and other accessories required to complete the job	LS	1			
5	ACSR "CARDINAL" conductors for 132kV switchyard with necessary hardwares, clamps for connecting, with all accessories for substation works and connection between tower & gantry, complete as per the specified scope of works:	LS	1			
6	ACSR conductors for 33 kV switchyard with necessary hardwares, clamps for connecting, with all accessories for substation works and for 33 kV overhead connections to the 33 kV lines at Pangtan and all other places as required to complete the specified scope of works:	LS	1			
7	33 kV distribution line Material for double circuit (13 mtr Galvanized Steel Tubular Pole, Conductor ACSR 'DOG', Insulators, galvanized cross arms, angle for bracing, spandle, bracing angle, flat strip, I & U bolt, nut & bolts etc) including stay set to complete the specified scope of the work as per NEA standards	KM	2			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
8	Air conditioning System:					
8.1	Ceiling cassette type split AC unit of 3 TR capacities including ceiling cassette type for 132 kV control room	Nos	4			
8.2	High wall type split AC unit of 2 TR capacities for 11 kV switchgear room	Nos	3			
8.3	High wall type split AC unit of 1.5 TR capacities for communication, battery, office room and staff quarter building	Nos	10			
9	Fire Protection System (Portable Trolley Wheel mounted extinguishers)					
9.1	30 litre foam type	Nos	4			
9.2	4.5 kg CO ₂ type	Nos	9			
9.3	22.5 kg Dry Chemical Powder (DCP) type	Nos	4			
9.4	Smoke detection system	LS	1			
9.5	Fire detection and Alarm System for control room	LS	1			
10	Identification plate, danger notice etc	LS	1			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
m)	LT Switchgear (As per Technical specification)					
1	400 V AC Main switchboard panel	Sets	1			
2	110 V DCDB	Sets	1			
3	48 V DCDB	Sets	1			
n)	Illumination System					
1	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery, along the approach road (with support where necessary), Staff quarter area etc as per technical specification	LS	1			
2	Emergency DC lighting system complete for switchyard, entrance and staff quarter area	Sets	12			
SUB TOTAL OF ELECTRIC EQUIPMENTS						
B)	SUBSTATION AUTOMATION/ COMMUNICATION/ SCADA (Based on IEC 61850)					
a)	SUBSTATION AUTOMATION SYSTEM:					
1	Complete Substation automation system including hardware and software for the substation & remote control stations alongwith associated equipments for the followings as per Technical Specification.					
1.1	132 kV System	bays	4			
1.2	33 kV System	bays	2			
1.3	11 kV System	bays	4			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
2	Integration of all 132/33/11kV Bays at Pangtan SS under present scope with the SIEMENS (Power 7) SCADA system at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	lot	1			
3	COMMUNICATION					
3.1	Digital Protection Coupler	nos	4			
3.2 (A)	Telecommunication equipments for Pangtan S/S					
3.2.1.A	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)					
(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equiped to complete function as per requirement in specification excluding (ii) & (iii) below	Lot	1			
(ii)	Optical Interface Cards/ SFP					
(a)	L4.2 SFP	Nos.	2			
(iii)	Tributary cards					
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2			
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
3.2.2. A	Equipment Cabinets	No.	1			
3.2.3.A	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2			
3.2.4. A	FODP	Nos.	2			
3.2.5.A	Fiber Optic Approach Cable	km	1			
C	Visual Monitoring System for watch & ward as per technical specification	LS	1			
	SUB TOTAL OF COMMUNICATION & SAS EQUIPMENTS					
D	CIVIL AND ARCHITECTURAL WORKS					
1	Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, gusset plates and all accessories: (For 132 and 33 kV side)					
1.1	132 kV take off gantry structures including bus bar support)	LS	1			
1.2	132 kV internal gantry structures including 132/33 kV transformer gantry structure (with bus bar support)	LS	1			
1.3	145 kV SF6 circuit breaker	sets	4			
1.4	145 kV disconnecting switch with earth switch	sets	2			
1.5	145 kV disconnecting switch without earth switch	sets	12			
1.6	132 kV voltage transformer	nos	12			
1.7	132 kV current transformer	nos	12			
1.8	120 kV surge arrester	nos	9			
1.9	132 kV Bus post insulator	no.	48			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
1.10	33 kV take off gantry structures	LS	1			
1.11	33 kV internal gantry structures	LS	1			
1.12	33 kV vacuum circuit breaker	sets	4			
1.13	33 kV disconnecting switch with earth switch	sets	2			
1.14	33 kV disconnecting switch without earth switch	sets	5			
1.15	33 kV voltage transformer	nos	9			
1.16	33 kV current transformer	nos	12			
1.17	30 kV surge arrester	nos	9			
1.18	33 kV Bus post insulator	no.	24			
1.19	Rail Structure for 132/33 and 33/11 Power Transformers including access from inter road (For transformer shifting)	LS	1			
1.20	Lightning/ Earth Mast	lot	1			
1.21	Supply and Fitting of switchyard fence including 2 nos gates, fence, pole and gates supply and civil works as per specification and drawing	RM	550			
SUB TOTAL OF STEEL STRUCTURES						
E)	CIVIL WORKS (MATERIAL PLUS LABOUR)					
1.1	132 kV take off gantry structures	LS	1			
1.2	132 kV internal gantry structures including 132/33 kV transformer gantry structure	LS	1			
1.3	132 kV SF6 gas circuit breaker	sets	4			
1.4	132 kV disconnecting switch with earth switch	sets	2			
1.5	132 kV disconnecting switch without earth switch	sets	12			
1.6	132 kV capacitor voltage transformer	nos	12			
1.7	132 kV current transformer	nos	12			

A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
1.8	120 kV surge arrester	nos	9			
1.9	132 kV Bus post insulator	nos	48			
1.10	Lightning/Earth Mast	LS	1			
1.11	33 kV take off gantry structures	LS	1			
1.12	33 kV internal gantry structures	LS	1			
1.13	33 kV Vacuum circuit breaker	sets	3			
1.14	33 kV disconnecting switch with earth switch	sets	2			
1.15	33 kV disconnecting switch without earth switch	sets	5			
1.16	33 kV potential transformer	nos	9			
1.17	33 kV current transformer	nos	12			
1.18	30 kV and 9 kV surge arrester	nos	9			
1.19	33 kV Bus post insulator	no.	24			
1.20	Rail Structure for 132/33 kV Power Transformer including access from inter road (For transformer shifting)	LS	1			
1.21	132/33 kV, 3 phase, 30 MVA power transformer foundation as per spec	nos	1			
1.22	33/0.4 kV, 3 phase, 250 KVA station transformer	nos	1			
1.23	RCC Cable Trench having maximum 6 ladder, Duct Bank, Conduit and Hand hole, Slab cover/Chequered plate and cable trays in swichyard and inside control building to complete the specified job also including for 33kv outgoing (for 2 feeders) & 11kV outgoing cable (for 4 feeders).	LS	1			
1.24	Construction of Water tank (24000 ltr) underground, 1000 ltr overhead pvc tank & with suction motor, one motor for water supply to overhead tank, auto cutoff switch and all complete accessories as specification & instruction of site engineer	LS	1			
1.25	Complete Drains system of Substation Premise at Pangtan SS including RCC slab cover	LS	1			
1.26	6/8 MVA, ONAN/ONAF, 33/11kV, PowerTransformer foundation works.	nos	1			
1.27	Rail Structure for 6/8 MVA ONAN/ONAF, 33/11 kV distribution Transformer including access from inter road (For transformer shifting)	LS	1			
2.0	Miscellaneous works:					

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A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
2.1	Exploration works for soil strength of foundations including laboratory tests, trial pitting, plate load test as specified in "Geotechnical Investigation" and as per direction of the Employer	location	7			
2.2	Soil resistivity test	lot	1			
2.3	Site grading with earth filling by borrow pit earth including compaction and leveling etc all to complete the specified works as per technical specification	Cu.M	24500			
2.4	Crushed rock surfacing including laying of sand and plastic as per technical specifications	Cu.M	2800			
2.5	Asphalt Road as per technical specification	Sq.M	3200			
2.6	Water supply system including testing of water quality	LS	1			
3.0	Control building (material plus labour) (plinth Area 352 Sq.m.) as per specification along with all finishing works including painting, electrification, flooring, air conditioning, false ceiling, cable trench, sanitary and plumbing works, water supply, furniture and miscellaneous work etc as specified to complete the scope of work.	LS	1			
4.0	Construction of two nos. two storeyed staff quarter (each of 480 Sq.m floor area for both floor and total of 960 sq. meter) including indoor fittings along with all finishing works and inclusive of painting, flooring electrification, air conditioning, sanitary and plumbing works, water supply, furniture and miscellaneous work etc as per drawing and specification to complete the scope of work.	LS	1			
5.0	Construction of one storeyed guard house (40 Sq.m floor area) including indoor fittings, flooring along with all finishing works including electrification, sanitary and plumbing works, water supply, furniture and miscellaneous work etc as per drawing and specification to complete the scope of work.	LS	1			
6.0	Miscellaneous Civil works: These items are intended to use for upgradation of road as the road width is insufficient at various locations (approx 15 km) for ease of transportation of equipment/material up to SS site and Protection of SS where applicable					
6.1	Survey Works to recommend/specify the exact location for requirement of excavation volume and type of protection required as specified	km	15			
6.2	M20 Conc. Nominal Mix 1:1.5:3 for protection work.	Cub m	125			
6.3	Reinforcement Bars	Kg	22500			

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A. PANGTAN SUBSTATION**Schedule No. 4 (a) : Construction, Installation, Testing and Commissioning Services**

S. No.	Item Description	Estimated		Unit Rate NPR	Total Amount NPR	Remarks
		Unit	Quantity			
6.4	Gabion Box Protection	Cub.m	1600			
6.5	Earth Work in Excavation	Cub.m	12000			
6.6	Stone Soling and compaction works on access road as per specification	Sq.M	1500			
6.7	Stone Masonary	Cub.m	850			
6.8	Gravel laying for approach road with compaction	Cub.m	650			
	SUB TOTAL OF CIVILAND ARCHITECTURAL WORKS (D)					
	TOTAL OF SCHEDULE 4 (a)					

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

A. PANGTAN SUBSTATION

Schedule No. 4 (b) : Training Charges for training to be imparted abroad

Schedule No. 4 (a) Training Charges for training to be imparted abroad								
Sl. No.	Description	Item for which training is to be imparted.	Country where training is to be imparted	Nos. of Trainee	Training duration in days	Unit Rate in US \$	Total Training Charges	Remarks
							Currency (US \$)	
				1	2	3	4=1*2*3	
A	Training to Owners personnel on Design, testing and Maintenance aspect as per Section Project, Technical Specification at manufacturer's works	i) Control & Protection and Substation Automation System		3	5			
		ii)Transformer		3	5			
Total for Training Charges								

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

Schedule No. 4 (c) : Installation and Other Services: Training Charges for training to be imparted in Nepal

S. No.	Description	Item for which training is to be imparted.	Unit Rate in US \$	Total Training Charges	
				Currency (US \$)	Total Training Charges in NRs
A	NOT APPLICABLE				
Total for Training Charges					



NEPAL ELECTRICITY AUTHORITY

Project Management Directorate Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

A. PANGTAN SUBSTATION

Schedule No. 4 (d): Maintenance Charge

S. No.	Description	Unit	Quantity	Unit Rate in NPR	Total Charges NPR	Remarks
		1	2	3	4=2*3	
1	Maintenance Charges for Communication Equipments including SDH & MUX. for One (1) year during Warranty period	Year	1			
2	Maintenance Charges for Communication Equipments including SDH & MUX. for Six (6) years after Warranty period	Year	6			
	Total Maintenance Charges for Communication Equipment Package					

NEPAL ELECTRICITY AUTHORITY
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Pangtan 132/33/11 kV Substation Project

F/C : Foreign Currency (USD)

L/C : Local Currency (NPR)

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

B. BAHRABISE SUBSTATION**Summary**

S.No.	DESCRIPTION	TOTAL AMOUNT	
		F/C	L/C
1	Schedule No.1: Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, clearing, forwarding and transportation up to site.		
2	Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.		
	SUB-TOTAL OF SUPPLY		
3	Schedule No.3: Design Services		
4	Schedule No.4:		
	a) Construction, Installation, Testing and Commissioning Services		
	b) Training Charges for training to be imparted abroad		
	c) Training Charges for training to be imparted in Nepal		
	d) Maintenance Charge		
GRAND TOTAL Excluding Taxes & Customs [1+2+3+4(a)+4(b)+4(c) +4 (d)]		\$ -	₹ -



NEPAL ELECTRICITY AUTHORITY
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Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

B. BAHRABISE SUBSTATION

Schedule No.1: Plant and Equipment including Mandatory Spares to be supplied from abroad

Item No.	Item description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
		1	2	3	4=2*3	
I	GIS Bahrabise Substation					
A	145kV Equipment					
1.0	145KV GIS Equipment					
1.1	145kV, SF6 GIS Bus Bars Module with Extension Module [Module description as per Technical Project specification]	Sets	2			
1.2	145kV, SF6 GIS Line bay Module [Module description as per Technical Project specification]	Sets	2			
1.3	SF6 Gas Insulated Bus Duct (GIB) outside GIS hall including Bus Duct support structure and associated accessories					
1.3.1	P1250A, 31.5kA, 1sec three phase (with accessories to complete the specified scope of works)	Mtr.	200			
1.4	145kV, SF6/Air Bushing for Connecting GIS to AIS alongwith support structure					
1.4.1	1250A, 31.5kA, 1sec single phase	Set	6			
2.0	145kV Equipment (AIS)					
2.1	120 kV Surge Arrestors (1-Phase)	Nos.	6			
2.2	8800pF, 145 kV Capacitive Voltage Transformer (1-Phase)	Nos.	6			
2.3	145KV Bus Post Insulator	Nos.	9			
3	145kV					
3.1	Line Control and Protection Panel	Nos.	2			
3.2	Other/Common equipments Pertaining to C & R System					
3.2.1	Time Synchronisation Equipment	No.	1			
3.2.2	Relay Test kit (three phase and as per specification)	No.	1			
B	Substation Automation					
1.0	132 kV System	Nos.	2			
C	Steel Structures (Tower,Gantry structures& Equipment support structures)					
1.0	Lattice/pipe Structure for towers,beams and equipments including peak plates/pack washers and gusset plates including foundation bolts(nuts,washers,MS plate welded at the bottom)					
1.1	Lattice structure & foundation bolts	MT	1			
1.2	Pipe Structure including Foundation Bolts .	MT	1			
1.3	Fastners for towers,beams and equipment support structures	MT	0.1			

B. BAHBABISE SUBSTATION**Schedule No.1: Plant and Equipment including Mandatory Spares to be supplied from abroad**

Item No.	Item description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
D	Erection Hardware :-Insulator strings, Disc Insulators, Hardware, conductor, bus-bar materials, cable trays, clamps, spacers, connectors including connectors for Auto Transformer , Junction box, earthwire, earthing material risers, buried cable trenches/pipe of equipment & lighting, all accessories etc. for the following:					
1	132 kV DM-type layout for GIS termination arrangement					
1.1	Line Bay	Sets	2			
E	Power and Control Cables					
1	1.1 kV LV Cables					
1.1	Power Cables(PVC)- (1.1kV grade)	LS	1			
1.2	Control Cable (PVC)- (1.1kV grade)	LS	1			
1.3	Cable glands, lugs & straight through joints for Power & Control cables	LS	1			
F	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect					
1.0	Earthing and connection with the existing earthing system with conductors, electrode, grounding materials complete with all accessories	LS	1			
2.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire and connecting with the existing system complete with all accessories to complete the specified scope of works	LS	1			
G	Substation Automation					
1.0	Integration of all 132 kV Bays at Bahrabise SS under present scope with the SIEMENS (Power 7) SCADA system at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	LS	1			
H	Cables along with clamps, glands, lugs and straight joints etc.					
1	Power Cables - (145kV grade)					
1.1	1Cx800 sqmm (XLPE) copper cable for line bay along with termination arrangement as per TS	km	2			
SUB TOTAL I						

B. BAHBABISE SUBSTATION**Schedule No.1: Plant and Equipment including Mandatory Spares to be supplied from abroad**

Item No.	Item description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
II	Mandatory Spares (Break up of Lumpsum quantity shall be as per Annexure-I, Section Project of Technical Specification).					
A	GIS (132 KV)					
1	General					
1.1	SF6 gas Pressure Relief Devices, 1Nos. of each type	Set	1			
1.2	SF6 Pressure gauge cum switch OR Density monitors and pressure switch as applicable (1 no. of each type)	Set	1			
1.3	Coupling device for pressure gauge cum switch for connecting Gas handling plant	Set	1			
1.4	Rubber Gaskets, "O" Rings and Seals for SF6 gas of each type	Set	1			
1.5	Molecular filter for SF6 gas with filter bags(20% of total weight)	Set	1			
1.6	All types of Control Valves for SF6 gas of each type	Set	1			
1.7	SF6 gas (20 % of total gas quantity)	Set	1			
1.8	All types of coupling for SF6 gas (1 no. of each type)	Set	1			
1.9	Pipe length (Copper or Steel as applicable) for SF6 Circuit of each type	Set				
1.10	Covers with all accessories necessary to close a compartment in case of dismantling of any part of the Enclosure to ensure the sealing of this compartment					
1.10.1	For 3 Phase Enclosure if applicable	No.	1			
1.10.2	For Single phase enclosure if applicable	No.	1			
1.11	Locking device to keep the Dis-connectors (Isolators) and Earthing switches in close or open position in case of removal of the driving Mechanism	Set	1			
1.12	Bus Support insulator of each type for 3 phase/single phase enclosure.	No.	1			
1.13	SF6 to air bushing (132 kV)	Sets	2			

B. BAHBABISE SUBSTATION**Schedule No.1: Plant and Equipment including Mandatory Spares to be supplied from abroad**

Item No.	Item description	Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation upto site (Excluding Taxes and Duties applicable in Nepal)	Remarks
		Unit	Quantity			
2	Relay & Protection					
2.1	Line Protection Panel					
2.1.1	Numerical distance relay (1 no. of each type)	Set	1			
2.2	Transformer Protection Panel					
2.2.1	Transformer differential protection	No.	1			
2.2.2	Restricted earth fault protection relay with non-linear resistor	No.	1			
2.2.3	Directional over current & E/F Protection Relay	no	1			
2.3	COMMON SPARES					
2.3.1	Power supply module for Bus Bar protection.	No.	1			
2.3.2	Bay unit module	Set	1			
2.4	Breaker protection Relay					
2.4.1	Breaker failure relay	No.	1			
2.4.2	Trip circuit supervision relay	Nos.	2			
2.4.3	Self reset trip relay (relay of each type)	Set	1			
2.4.4	Hand reset trip relay(relay of each type)	Set	1			
2.4.5	Timer relay(relay of each type)	Set	1			
2.4.6	DC supervision relay(relay of each type)	Set	1			
2.4.7	Flag relays(relay of each type)	Set	1			
2.4.8	Auxiliary relays(relay of each type)	Set	1			
	SUB-TOTAL II					
	Total For Bahrabise Substation (Subtotal I+ Subtotal II)					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

B. BAHRABISE SUBSTATION

Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.

Item No.	Item description			Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation to site (Including Taxes and Duties applicable in Nepal)	Remarks
1	GIS Bahrabise Substation					
A	145 kV Equipment					
1.0	145 kV GIS Equipment					
1.1	145kV, SF6 GIS Bus Bars Module with Extension Module [Module description as per Technical Project specification]	Sets	2			
1.2	145kV, SF6 GIS Line bay Module [Module description as per Technical Project specification]	Sets	2			
1.3	SF6 Gas Insulated Bus Duct (GIB) outside GIS hall including Bus Duct support structure and associated accessories					
1.3.1	P1250A, 31.5kA, 1sec three phase (with accessories to complete the specified scope of works)	Mtr.	200			
1.4	145kV, SF6/Air Bushing for Connecting GIS to AIS alongwith support structure					
1.4.1	1250A, 31.5kA, 1sec single phase	Set	6			
2.0	145kV Equipment (AIS)					
2.1	120 kV Surge Arrestors (1-Phase)	Nos.	6			
2.2	8800pF, 145 kV Capacitive Voltage Transformer (1-Phase)	Nos.	6			
2.3	145KV Bus Post Insulator	Nos.	9			
3	145kV					
3.1	Line Control and Protection Panel	Nos.	2			
3.2	Other/Common equipments Pertaining to C & R System					
3.2.1	Time Synchronisation Equipment	No.	1			
3.2.2	Relay Test kit (three phase and as per specification)	No.	1			

B. BAHRABISE SUBSTATION

Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.

Schedule No.2: Plant and Equipment (including mandatory spares parts) supplied within Nepal including insurance, clearing, forwarding and transportation up to site.						
Item No.	Item description			Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation to site (Including Taxes and Duties applicable in Nepal)	Remarks
		Estimated				
B	Substation Automation					
1.0	132 kV System	Nos.	2			
C	Steel Structures (Tower,Gantry structures& Equipment support structures)					
1.0	Lattice/pipe Structure for towers,beams and equipments including peak plates/pack washers and guest paltes including foundation bolts(nuts,washers,MS plate welded at the bottom)					
1.1	Lattice stucture & foundation bolts	MT	1			
1.2	Pipe Structure including Foundation Bolts .	MT	1			
1.3	Fastners for towers,beams and equipment support strctures	MT	0.1			
D	Erection Hardware :-Insulator strings, Disc Insulators, Hardware, conductor, bus-bar materials, cable trays, clamps, spacers, connectors including conectors for Auto Transformer , Junction box, earthwire, earthing material risers, buried cable trenches/pipe of equipment & lighting, all accessories etc. for the following:					
1	132 kV DM-type layout for GIS termination arrangement					
1.1	Line Bay	Sets	2			
E	Power and Control Cables					
1	1.1 kV LV Cables					
1.1	Power Cables(PVC)- (1.1kV grade)	LS	1			
1.2	Control Cable (PVC)- (1.1kV grade)	LS	1			
1.3	Cable glands, lugs & straight through joints for Power & Control cables	LS	1			

B. BAHRABISE SUBSTATION

Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.

Item No.	Item description			Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation to site (Including Taxes and Duties applicable in Nepal)	Remarks
		Estimated				
F	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect					
1.0	Earthing and connection with the existing earthing system with conductors, electrode, grounding materials complete with all accessories	LS	1			
2.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire and connecting with the existing system complete with all accessories to complete the specified scope of works	LS	1			
G	Substation Automation					
1.0	Integration of all 132 kV Bays at Bahrabise SS under present scope with the SIEMENS (Power 7) SCADA system at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	LS	1			
H	Cables along with clamps, glands, lugs and straight joints etc.					
1	Power Cables - (145kV grade)					
1.1	1Cx800 sqmm (XLPE) copper cable for line bay along with termination arrangement as per TS	km	2			
	SUB TOTAL I					
II	Mandatory Spares (Break up of Lumpsum quantity shall be as per Annexure-I, Section Project of Technical Specification).					
A	GIS (132 KV)					
1	General					
1.1	SF6 gas Pressure Relief Devices, 1Nos. of each type	Set	1			
1.2	SF6 Pressure gauge cum switch OR Density monitors and pressure switch as applicable (1 no. of each type)	Set	1			
1.3	Coupling device for pressure gauge cum switch for connecting Gas handling plant	Set	1			
1.4	Rubber Gaskets, "O" Rings and Seals for SF6 gas of each type	Set	1			
1.5	Molecular filter for SF6 gas with filter bags(20% of total weight)	Set	1			
1.6	All types of Control Valves for SF6 gas of each type	Set	1			
1.7	SF6 gas (20 % of total gas quantity)	Set	1			
1.8	All types of coupling for SF6 gas (1 no. of each type)	Set	1			
1.9	Pipe length (Copper or Steel as applicable) for SF6 Circuit of each type	Set				
1.10	Covers with all accessories necessary to close a compartment in case of dismantling of any part of the Enclosure to ensure the sealing of this compartment					
1.10.1	For 3 Phase Enclosure if applicable	No.	1			
1.10.2	For Single phase enclosure if applicable	No.	1			
1.11	Locking device to keep the Dis-connectors (Isolators) and Earthing switches in close or open position in case of removal of the driving Mechanism	Set	1			
1.12	Bus Support insulator of each type for 3 phase/single phase enclosure.	No.	1			
1.13	SF6 to air bushing (132kV)	Sets	2			

B. BAHRABISE SUBSTATION

Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.

Item No.	Item description					
		Estimated		Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation to site (Including Taxes and Duties applicable in Nepal)	Remarks



B. BAHRABISE SUBSTATION

Schedule No.2: Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.

Annexure 10.2: Plant and Equipment (including mandatory Spares Parts) supplied within Repair including Insurance, Clearing, forwarding and transportation up to site.						
Item No.	Item description			Unit Rate in US\$	CIP Project Site including insurance, clearing, forwarding and transportation to site (Including Taxes and Duties applicable in Nepal)	Remarks
		Estimated				
2	Relay & Protection					
2.1	Line Protection Panel					
2.1.1	Numerical distance relay (1 no. of each type)	Set	1			
2.2	Transformer Protection Panel					
2.2.1	Transformer differential protection	No.	1			
2.2.2	Restricted earth fault protection relay with non-linear resistor	No.	1			
2.2.3	Directional over current & E/F Protection Relay	no	1			
2.3	COMMON SPARES					
2.3.1	Power supply module for Bus Bar protection.	No.	1			
2.3.2	Bay unit module	Set	1			
2.4	Breaker protection Relay					
2.4.1	Breaker failure relay	No.	1			
2.4.2	Trip circuit supervision relay	Nos.	2			
2.4.3	Self reset trip relay (relay of each type)	Set	1			
2.4.4	Hand reset trip relay(relay of each type)	Set	1			
2.4.5	Timer relay(relay of each type)	Set	1			
2.4.6	DC supervision relay(relay of each type)	Set	1			
2.4.7	Flag relays(relay of each type)	Set	1			
2.4.8	Auxiliary relays(relay of each type)	Set	1			
	SUB-TOTAL II					
	Total For PART 1 Bahrabise Substation (Subtotal I+ Subtotal II)					

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate Pangtan 132/33/11 kV Substation Project

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B. BAHRABISE SUBSTATION

Schedule No. 3 : Design Services

Sl. No.	Description	Item for which design is to be imparted.	Unit Rate in US \$	Total Amount US \$	Remarks
A	NOT APPLICABLE				

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B. BAHRABISE SUBSTATION

Schedule No. 4 (a): Installation and Other Services

(a): Construction, Installation, Testing and Commissioning Services

Sl. No.	Item Description	Estimated				
		Unit	Qty.	Unit Rate NPR	Total Amount NPR	Remarks
		1	2	3	4=2*3	
I	GIS Bahrabise Substation					
A	145 kV Equipment					
1	145 kV GIS Equipment					
1.1	145kV, SF6 GIS Bus Bars Module [Module description as per Technical Project specification]	Sets	2			
1.2	145kV, SF6 GIS Line bay Module [Module description as per Technical Project specification]	Sets	2			
1.3	145kV, SF6 GIS ICT feeder bay Module for 132/11 kV 3-ph Transformer [Module description as per Technical Project specification]	Sets	1			
1.4	SF6 Gas Insulated Bus Duct (GIB) outside GIS hall including Bus Duct support structure and associated accessories					
1.4.1	1250A, 31.5 kA, 1sec three phase	Mtr	200			
1.5	145kV, SF6/Air Bushing for Connecting GIS to AIS alongwith support structure					
1.5.1	1250A, 31.5kA, 1sec single phase	Set	6			
2.0	145kV Equipments (AIS)					
2.1	120 kV Surge Arrestors (1-Phase)	Nos.	6			
2.2	8800pF, 145 kV Capacitive Voltage Transformer (1-Phase)	Nos.	6			
2.3	145KV Bus Post Insulator	Nos.	9			
3	145kV					
3.1	Line Control and Protection Panel	Nos.	2			
C	Steel Structures (Tower,Gantry structures& Equipment support structures)					
1	Lattice/pipe Structure for towers,beams and equipments including peak plates/pack washers and gusset plates including foundation bolts(nuts,washers,MS plate welded at the bottom)					
1.1	Lattice structure & foundation bolts	MT	1			
1.2	Pipe Structure including Foundation Bolts .	Mt	1			
1.3	Fasteners for towers,beams and equipment support structures	MT	0.1			

B. BAHRABISE SUBSTATION

Schedule No. 4 (a): Installation and Other Services

(a): Construction, Installation, Testing and Commissioning Services

Sl. No.	Item Description	Estimated				
		Unit	Qty.	Unit Rate NPR	Total Amount NPR	Remarks
D	Erection Hardware :-Insulator strings, Disc Insulators, Hardware, conductor, bus-bar materials, cable trays, clamps, spacers, connectors including connectors for Auto Transformer , Junction box, earthwire, earthing material risers, buried cable trenches/pipe of equipment & lighting, all accessories etc. for the following:					
1	132 kV DM-type layout for GIS termination arrangement					
1.1	Line Bay	Sets	2			
E	Power and Control Cables					
1	1.1 kV LV Cables					
1.1	Power Cables(PVC)- (1.1kV grade)	LS	1			
1.2	Control Cable (PVC)- (1.1kV grade)	LS	1			
1.3	Cable glands, lugs & straight through joints for Power & Control cables	LS	1			
F	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect					
1.0	Earthing and connection with the existing earthing system with conductors, electrode, grounding materials complete with all accessories	LS	1			
2.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire and connecting with the existing system complete with all accessories to complete the specified scope of works	LS	1			
G	Substation Automation					
1	Integration of all 132 kV Bays at Bahrabise SS under present scope with the SIEMENS (Power 7) SCADA system at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project	LS	1			
H	Cables along with clamps, glands, lugs and straight joints etc.					
1	Power Cables - (145 kV grade)					
1.1	1Cx800 sqmm (XLPE) copper cable for line bay along with termination arrangement as per TS along with the cable trench as per specification	km	2			
	SUB TOTAL I					

B. BAHRABISE SUBSTATION**Schedule No. 4 (a): Installation and Other Services****(a): Construction, Installation, Testing and Commissioning Services**

Sl. No.	Item Description	Estimated				
		Unit	Qty.	Unit Rate NPR	Total Amount NPR	Remarks
III	Civil Works					
1.0	Excavation in all types of soil and rock including backfilling disposal etc. for all leads and lifts	Cu.M	25			
2.0	Providing and laying of Plain Cement Concrete (PCC) (1:2:4)	Cu.M	6.2			
3.0	Providing and laying of Reinforced Cement Concrete Design Mix M25 including pre cast, shuttering, Grouting of pockets & underpinning but excluding steel reinforcement	Cu.M	24			
4.0	Steel Reinforcement (Fe 500)	MT	5			
	SUB-TOTAL III					
	Total for 220 /132/11kV Bahrabise Substation (I+III)					

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate

Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

B. BAHRABISE SUBSTATION

Schedule No. 4 (b) : Training Charges to be imparted abroad

Sl. No.	Description	Item for which training is to be imparted.	Country where training is to be imparted	Nos. of Trainee	Training duration in days	Unit Rate in US \$	Total Training Charges	Remarks
							Currency (US \$)	
				1	2	3	4=1*2*3	
A	Training to Owners personnel on Design, testing and Maintenance aspect as per Section Project, Technical Specification at manufacturer's works	GIS		3	5			
Total for Training Charges								

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

B. BAHRABISE SUBSTATION

Schedule No. 4 (c) : Installation and Other Services: Training Charges for training to be imparted in Nepal

S. No.	Description	Item for which training is to be imparted.	Unit Rate	Total Training Charges		Remarks
				Currency (US \$)	Total Training Charges in NRs	
A	NOT APPLICABLE					
Total for Training Charges						

NEPAL ELECTRICITY AUTHORITY

Project Management Directorate Pangtan 132/33/11 kV Substation Project

PMD/EGMP/PSSP -077/78 -01:Design, Supply, Installation, Testing and Commissioning of Pangtan 132/33/11 kV Substation and Associated Bay Extension Works at Bahrabise Substation.

B. BAHRABISE SUBSTATION

Schedule No. 4 (d): Maintenance Charge

S. No.	Description	Unit	Quantity	Unit Rate Adopted in NRs	Total Charges	Remarks
		1	2	3	4=2*3	
	NOT APPLICABLE					
	Total Maintenance Charges for Communication Equipment Package					