TENDER DOCUMENT

for

Renovation & Up-gradation of Protection Systems of 132kV Sub-Stations in Mizoram

under

Power System Development Fund (PSDF)

Volume-III

BID PROPOSAL SHEET

Office of the Superintending Engineer, Mizoram SLDC Circle,
P&E Department, Government of Mizoram
Mizoram: Aizawl

January-2017

VOLUME – III
(BID PROPOSAL SHEETS)

CONTENTS

SECTION – I:

BID FORMS

Bid Form (Bid Envelope)

Bid Proposal Ref. No.: ..... Date: ……..

To

The Superintending Engineer, Mizoram SLDC Circle,
Power & Electricity Department,
Mizoram, Aizawl - 796001

Subject: R&U of Protection Systems of 132kV Sub Stations in Mizoram under PSDF

Sir,

1.0 Having examined the Bidding Documents ..... dated…….. the receipt of which is hereby acknowledged, I/we the undersigned, offer to design, manufacture, test, deliver, install and commission (including carrying out trial operation, performance & Guarantee Test as per the provision of Technical Specification) the facilities under the above-named package in full conformity with the said Bidding Documents. We hereby submit our Bid, in envelope 1 and envelope 2.

2.0 Attachments to the Bid Form (Bid Envelope) : In line with the requirement of the Bidding Documents, we enclose herewith the following attachments:

(a) **Attachment 1**: Bid Security, in a separate envelope, in the form of Bank Draft/Pay Order/Banks certified Cheque for a sum of ..... …….. (Details of Earnest Money shall be mentioned in a separate sheet showing the items to which bid is submitted)

(b) **Attachment 2**: Manufacturer's Authorisation Forms - registered/notarized

(c) **Attachment 3**: Work Completion Schedule

(d) **Attachment 4**: Guarantee Declaration.

(e) **Attachment 5**: Declaration for tax exemptions, reductions, allowances or benefits

(f) **Attachment 6**: Declaration

3.0 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents to ascertain the full scope of Work included in each item while filling-in the rates and prices in price schedule.

3.1 We declare that prices quoted by us in the Price Schedules shall be fixed and firm during the execution of Contract.

4.0 We confirm that except as otherwise specifically provided our bid prices quoted includes all taxes, duties, levies and other charges which may be assessed on us by all municipal, state or national government authorities in and outside India.

4.1 Service Tax, if applicable, for the services to be rendered by us, the same is included in our bid price quoted.

5.0 We have read all the provisions and clauses in the GCC, SCC, ECC & GTC and confirm that they were acceptable to us. Further we understand that deviation taken in any of the above clauses by us may make our bid non-responsive as per provision of bidding documents and be rejected by you.

6.0 We undertake, if our bid is accepted, to commence the work immediately upon your Notification of Award to us, and to achieve the delivery of goods and related services within the time stated in the Bidding Documents.

7.0 If our bid is accepted, we undertake to provide a Performance Security(ies) in the form and amounts, and within the times specified in the Bidding Documents.

8.0 We agree to abide by this bid for a period of twelve (12) months from the date fixed for opening of bids, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

9.0 Until a formal Contract is prepared and executed between us, this bid, together with your written acceptance thereof in the form of your Notification of Award shall constitute a binding contract between us.

10.0 We understand that you are not bound to accept the lowest or any bid you may receive.

11.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named here and that no other persons or firms other than those mentioned herein have any interest in this proposal or in the Contract to be entered into, if the award is made on us, that this proposal is made without any connection with any other person, firm or party likewise submitting a proposal is in all respects for and in good faith, without collusion or fraud.

Yours Sincerely,

For and on behalf of the [Name of the Bidder]
(Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....
Business Address:

Attachment-2

(Manufacturer's Authorization Form)
(On Manufacturers Letterhead)

To:

The Superintending Engineer, Mizoram SLDC Circle,
Power & Electricity Department,
Mizoram, Aizawl - 796001

Dear Sir,

WE [*Insert: name of Manufacturer*] who are established and reputable manufacturers of [*insert" name and/or description of the plant & equipment*] having production facilities at [*insert: address of factory*] do hereby authorize [*insert: name & address of Bidder*] (hereinafter, the "Bidder") to submit a bid, and subsequently negotiate and sign the Contract with you against NIT [*Insert: title and reference number of NIT*] including the above plant & equipment or other goods produced by us.

We hereby extend our full guarantee and warranty for the above specified plant & equipment materials or other goods offered supporting the supply, installation and achieving of Operational Acceptance of the plant by the Bidder against these Bidding Documents, and duly authorize said Bidder to act on our behalf in fulfilling these guarantee and warranty obligations. We also hereby declare that we and ...., [*Insert: name of the Bidder*] have entered into a formal relationship in which, during the duration of the Contract (including warranty / defects liability) we, the Manufacturer or Producer, will make our technical and engineering staff fully available to the technical and engineering staff of the successful Bidder to assist that Bidder, on a reasonable and best effort basis, in the performance of all its obligations to the Purchaser under the Contract.

For and on behalf of the Manufacturer
Signed:

Date:

In the capacity of *[Insert.' title of position or other appropriate designation*] and this should be signed by a person having the power of attorney to legal bind the manufacturer.

Date: ....
Place: ....

(Signature) .....
(Printed Name)..... .... ..
Designation) ....
(Common Seal)

Note 1. The letter of Undertaking should be on the letterhead of the Manufacturer and should be signed by a person competent and having Power of Attorney to legally bind the Manufacturer. It shall be included by the bidder in its bid.

Attachment-3

(Work Completion Schedule)

Bidder's Name and Address:

To:

The Superintending Engineer, Mizoram SLDC Circle,
Power & Electricity Department,
Mizoram, Aizawl - 796001

Dear Sir,

We hereby declare that the following Work Completion Schedule shall be followed by us in furnishing and installation of the subject Package for the period commencing from the effective date of Contract to us:

Sl. No.	Description of work	Period in months from the effective date of Contract
1	Detailed Engineering and drawing submission a) commencement b) completion	
2	Procurement of equipments components & assembly a) commencement b) completion	
3	Manufacturing a) commencement b) completion	
4	Shipments & Delivery a) commencement b) completion	
5	Establishment of site office Installation at Site a) commencement b) completion	
6	Erection a) commencement b) completion	
7	Testing & Pre-commissioning a) commencement b) completion	
8	Trial Operation a) commencement b) completion	

Date: ....
Place: ....

(Signature) .....
(Printed Name).....
(Designation).....
(Common Seal).....

Note: Bidders to enclose a detailed network covering all the activities to be undertaken for completion of the project indicating key dates for various milestones for each work.

Attachment-4

(Guarantee Declaration)

Bidder's Name and Address:

To:

The Superintending Engineer, Mizoram SLDC Circle,
Power & Electricity Department,
Mizoram, Aizawl - 796001

Dear Sir,

We hereby declare that this Attachment of "Guarantee Declaration" is furnished by us in First Envelope of bid.

Date: ....
Place: ....

(Signature) ....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Attachment- 5

(Declaration for tax exemptions, reductions, allowances or benefits)

Bidder's Name and Address:

To:

The Superintending Engineer, Mizoram SLDC Circle,
Power & Electricity Department,
Mizoram, Aizawl - 796001

Dear Sirs,

We confirm that we are solely responsible for obtaining following tax exemptions, reductions, allowances or benefits in respect of supplies under the subject package, in case of award. We further confirm that we have considered the same in our bid thereby passing on the benefit to _____ (Name of Employer/Purchaser) while quoting our prices. In case of our failure to receive such benefits, partly or fully, for any reason whatsoever, the Employer will not compensate us.

We are furnishing the following information required by the Employer for issue of requisite certificate if and as permitted in terms of the applicable Govt. of India policies/procedures (in case of award):

Applicable Act, Notification No. and Clause Ref. No.	Sl.No.	Description of item on which applicable	Country of origin	Remarks, if any

(The requirements listed above are as per current Notification of Govt. of India indicated above. These may be modified, if necessary, in terms of the Notifications.)

Date: ....
Place: ....

Signature) .....
(Printed Name) .....
(Designation) .....
(Common Seal) .....

Attachment-6

(Declaration)

Bidder's Name and Address:

To:

The Superintending Engineer, Mizoram SLDC Circle,
Power & Electricity Department,
Mizoram, Aizawl - 796001

Dear Sir,

We confirm that Bid Forms and Price Schedules in the Second Envelope have been filled up by us as per the provisions of the Instruction to Bidders. Further, we have noted that the same shall be evaluated as per the provisions of the Bidding Documents.

Further, we hereby confirm that:

(i) there are no discrepancies/inconsistencies and deviations/omissions/reservations to the Bidding Documents, in the Second Envelope bid;
(ii) the description of items and the unit thereof in the price schedules in the Second Envelope bid are in conformity with those indicated in the price schedule of the Bidding Documents without any deviation to the specified scope of work.

We also confirm that in case any discrepancies/ inconsistencies and deviations/omissions/reservations, as referred to in para (i) and (ii) above, is observed in the Second Envelope, the same shall be deemed as withdrawn/rectified without any financial implication, whatsoever to _____(Name of Employer/purchaser).

Date:..... .... ..
Place: .....

(Signature) : .....
(Printed Name): _____
(Common Seal): _____

SECTION – II:

GUARANTEED TECHNICAL PARTICULARS (GTP)

I. G T P for 110V BATTERY BANK, BATTERY CHARGER & DC DISTRIBUTION BOARD

(To be filled in by the Bidder and shall be submitted with Technical Bid)

A. BATTERY

Sl. No.	Description	Particulars
1.	Name & Address of Supplier & Manufacturer	
2.	Manufacturer's type designation	
3.	Cell Type ( )	
4.	Capacity in ampere hour (at 27° C, C10 to 1.75 ECV)	
5.	Nominal cell **voltage** (volts)	
6.	No. of cells: Absorbed glass mat/ gel	
	Guaranteed Amp-Hour Capacity (at the 10-hr rate) to Specified	
	(a) 1 Minute	
	(b) 15 Minute	
	(c) 1 Hour	
7.	(d) 2 Hour	
	(e) 3 Hour	
	(f) 4 Hour	
	(g) 6 Hour	
	(g) 8 Hour	
	(g) 10 Hour	
8.	Ah efficiency	
9.	Wh **efficiency**	
10.	Self-discharge per week	
11.	Cyclic life of the **battery** @ 27° C	
12.	Service life expectancy	
13.	**Recommended Maximum** period of storage	
	Positive Plates	
	(a) No of plate per cell	
14.	(b) Type of plate	
	(c) Total surface area of plate	
	(d) Grid Material	
	Negative Plates	
15.	(a) No of plate per cell	
	(b) Type of plate	
	(c) Total surface area of plate	

Sl. No.	Description		Particulars
	(d) Grid Material		
16.	Material of Container		
17.	Type of separator		
18.	Terminal		
19.	Safety valve	Opening pressure - Closing	
20.	Painting of Battery racks		
21.	Complete weight of the cell		
22.	Net weight of each battery bank		
23.	Overall dimensions of each battery- bank		
24.	**Method** *of connection between cells*		
25.	Protection for terminals		
	Recommended Charging		
26.	a) Float Mode Charging	(i) Voltage (ii) Current	
	b) Boost Mode Charging	(i) Voltage (ii) Current	
27.	Time required to charge the battery from fully discharged condition to 90% SOC in boost mode at 27°C		

B.CHARGER

S No.	Description	Particulars
1.0	Name & Address of Manufacturer	
2.0	Type of transformer used for charger	
3.0	Rating of the transformer	
4.0	Voltage ratio of the transformer	
5.0	Phase	
6.0	Frequency	
7.0	Winding connection	
8.0	Class of insulation	
9.0	Impedance of the transformer	
10.0	Reference standard	
11.0	Type of charger control	
12.0	Whether over current/over voltage features provided?	
13.0	Facilities for boost charging	

14.0	Types of alarms	
15.0	Type of protection against short circuit and overloads	
16.0	Type of protection at charger's output terminals	
17.0	Protection for thyristor if installed	
	Output voltage range under (preset values)	
18.0	(a) Float Charger Section	
	(b) Boost Charger Section	
19.0	The output controllable current range	
20.0	Max. current and voltage output of the charger	
21.0	Protection against overcharging	
22.0	Details of Automatic Voltage Regulator	
23.0	Manual suitable pots for controlling maximum current and	
24.0	Kind of indicating meters provided on the charger's panel	
25.0	Blocking diode installed	

C. DCDB

S No.	Description	Particulars
1.0	Name & Address of Supplier & Manufacturer	
2.0	Detail dimensions of D.C.D.B	
3.0	Thickness of steel sheets proposed to be used	
4.0	Busbars: a. Standard applicable: b. Material and cross section: c. Current ratin d. Type of insulator	

5.0	Details of wiring: a. Cross-section: b. Voltage grade : c. Solid or stranded: d. Material	
6.0	Details of Instruments:	
	a. Standards Applicable: b. Manufacturer's name and type c. Range d. Accuracy class	
7.0	Details of air break switches and fuses (manufacturer's name, type, rating, capacity etc.)	
8.0	D.C. Air Circuit Breakers: a. Manufacturer's name: b. Type : c. Standard Applicable: d. Rated Voltage: e. Rated continuous current: f. Rated making/breaking current: g. Overload/short circuit current release	
9.0	Details of relays, if used.	

Place :_____ **Signature & Seal of Bidder**

Date :_____

II. G T P for 48V BATTERY BANK, BATTERY CHARGER & DC DISTRIBUTION BOARD

(To be filled in by the Bidder and shall be submitted with Technical Bid)

A. BATTERY

Sl. No.	Description	Particulars
1.	Name & Address of Supplier & Manufacturer	
2.	Manufacturer's type designation	
3.	Cell Type ( )	
4.	Capacity in ampere hour (at 27° C, C10 to 1.75 ECV)	
5.	Nominal cell **voltage** (volts)	
6.	No. of cells: Absorbed glass mat/ gel cell/other(specify)	
	Guaranteed Amp-Hour Capacity (at the 10-hr rate) to Specified	
	(a) 1 Minute	
	(b) 15 Minute	
	(c) 1 Hour	
7.	(d) 2 Hour	
	(e) 3 Hour	
	(f) 4 Hour	
	(g) 6 Hour	
	(g) 8 Hour	
	(g) 10 Hour	
8.	Ah efficiency	
9.	Wh **efficiency**	
10.	Self-discharge per week	
11.	Cyclic life of the **battery** @ 27° C	
12.	Service life expectancy	
13.	**Recommended Maximum** period of storage	
	Positive Plates	
	(a) No of plate per cell	
14.	(b) Type of plate	
	(c) Total surface area of plate	
	(d) Grid Material	
	Negative Plates	
15.	(a) No of plate per cell	

	(b) Type of plate		
	(c) Total surface area of plate		
	(d) Grid Material		
16.	Material of Container		
17.	Type of separator		
18.	Terminal		
19.	Safety valve	Opening pressure - Closing	
20.	Painting of Battery racks		
21.	Complete weight of the cell		
22.	Net weight of each battery bank		
23.	Overall dimensions of each battery- bank		
24.	**Method** *of connection between cells*		
25.	Protection for terminals		
26.	Recommended Charging		
	a) Float Mode Charging	(i) Voltage (ii) Current	
	b) Boost Mode Charging	(i) Voltage (ii) Current	
27.	Time required to charge the battery from fully discharged condition to 90% SOC in boost mode at 27°C		

B.CHARGER

S No.	**Description**	**Particulars**
1.0	Name & Address of Manufacturer	
2.0	Type of transformer used for charger	
3.0	Rating of the transformer	
4.0	Voltage ratio of the transformer	
5.0	Phase	
6.0	Frequency	
7.0	Winding connection	
8.0	Class of insulation	
9.0	Impedance of the transformer	
10.0	Reference standard	
11.0	Type of charger control	
12.0	Whether over current/over voltage features provided?	
13.0	Facilities for boost charging	
14.0	Types of alarms	

15.0	Type of protection against short circuit and overloads	
16.0	Type of protection at charger's output terminals	
17.0	Protection for thyristor if installed	
18.0	Output voltage range under (preset values)	
	(a) Float Charger Section	
	(b) Boost Charger Section	
19.0	The output controllable current range	
20.0	Max. current and voltage output of the charger	
21.0	Protection against overcharging	
22.0	Details of Automatic Voltage Regulator	
23.0	Manual suitable pots for controlling maximum current and	
24.0	Kind of indicating meters provided on the charger's panel	
25.0	Blocking diode installed	

C. DCDB

S No.	Description	Particulars
1.0	Name & Address of Supplier & Manufacturer	
2.0	Detail dimensions of D.C.D.B	
3.0	Thickness of steel sheets proposed to be used	
4.0	Bus bars: a. Standard applicable: b. Material and cross section: c. Current rating d. Type of insulator	
5.0	Details of wiring: a. Cross-section: b. Voltage grade : c. Solid or stranded: d. Material	

S No.	Description	Particulars
6.0	Details of Instruments: a. Standards Applicable: b. Manufacturer's name and type: c. Range: d. Accuracy class	
7.0	Details of air break switches and fuses (manufacturer's name, type, rating, capacity etc.)	
8.0	D.C. Air Circuit Breakers: a. Manufacturer's name: b. Type : c. Standard Applicable: d. Rated Voltage: e. Rated continuous current: f. Rated making/breaking current: g. Overload/short circuit current release setting range:	
9.0	Details of relays, if used	

Place :_____ **Signature & Seal of Bidder**

Date :_____

III. G T P for 250KVA, 33/0.415 KV TRANSFORMER
(To be filled in by the Bidder and shall be submitted with Technical Bid)

Sl. No.	Description	Guaranteed Particulars
1.0	Manufacturer's Name & Address of manufacturing plant	
2.0	Standard applicable	
3.0	Rating (KVA)	
4.0	Voltage ratio (kV)	
5.0	Winding connection	
6.0	Vector group	
7.0	Number of phases	
8.0	Frequency (Hz)	
9.0	Type of cooling	
10.0	Rating available at any tapping with ONAN cooling	
11.0	Permissible overload	
12.0	Impedance Data	
12.1	Ohmic impedance at 75^0 C and rated frequency based on rated power on HV winding (%)	
	▪ Principal tap	
	▪ Maximum tap	
	▪ Minimum tap	
12.2	Tolerance applicable to above impedance	
	▪ Principal tap	
	▪ Maximum tap	
	▪ Minimum tap	
12.3	Zero sequence impedance (%)	
	▪ Principal tap	
	▪ Maximum tap	
	▪ Minimum tap	
12.4	Minimum Air core impedance (%)	
13.0	Guaranteed Losses& Tolerances	
13.1	Guaranteed Losses	
	a) Total Loss 50% of rated load (No load loss + load loss at 75 ^{0}C)	
	b) Total loss at 100% rated load	
	c) No load loss on principal tap at rated voltage and frequency (KW)	
	d) Load loss (Copper Loss) at rated HV and IV load without LV loading at principal tap at 75ºC (KW)	

	e) Total loss (a+b) (KW)	
13.2	Tolerances if applicable on above losses	
	a) No load loss on principal tap at rated voltage and frequency (KW)	
	b) Load loss (Copper Loss) at rated HV and IV load without LV loading at principal tap at 75ºC (KW)	
	c) Cooler loss (K/W)	
	d) Total loss (a+b), (KW)	
14.0	Cooling Equipment Details	
14.1	Number of radiator bank and its rating as % of transformer cooling	
	Radiator	
	a) Type of mounting	
	b) Material	
	c) Thickness	
15.0	Thermal Data	
15.1	Temperature rise in top oil over an ambient of 50^0 C. (^{0}C)	
15.2	Temperature rise in winding by resistance measurement method over an ambient of 50^0 C. (^{0}C)	
15.3	Winding hotspot temperature over an ambient of50^0 C. (^{0}C)	
15.4	Core hotspot temperature over an ambient of 50^0 C. (^{0}C)	
15.5	Position of core hotspot	
15.6	Thermal time constant (Hours)	
16.0	Maximum noise level at	
17.0	Core	
17.1	Manufacturer of core material	
17.2	Type of construction (core/shell)	
17.3	Diameter of the core (mm)	
17.4	Core area (mm^2)	
	a) Yoke	
	b) Wound limb	
	c) Unwound limb	
17.5	Core material and grade used	
17.6	Type of joint between core and yoke	
17.7	Thickness of stamping (mm)	

17.8	Percentage silicon content (%)	
17.9	Maximum flux density in core at rated frequency and at	
	a) 90% voltage (wb/sq.m)	
	b) 100% voltage (wb/sq.m)	
	c) 110% voltage (wb/sq.m)	
18.0	Over excitation withstand time (secs.).	
18.1	1.05 Um	
18.2	1.25 Um	
18.3	1.50 Um	
19.0	Winding	
19.1	Type of winding	
	a) HV	
	b) IV	
	c) LV	
	d) Regulating	
19.2	Current density at rated load	
	a) HV	
	b) IV	
	c) LV	
19.3	Conductor area	
19.4	a) HV	
19.5	b) IV	
19.6	c) LV	
19.7	Maximum current density under short circuit	
19.8	a) HV	
19.9	b) IV	
19.10	c) LV	
19.11	Magnetizing inrush current (Amps)	
19.12	No load current (Amps) at rated frequency and at	
	a) 90% voltage	
	b) 100% voltage	
	c) 112.5% voltage	
19.13	Voltage per turn for maximum flux density	
	a) HV (Volts	
	b) IV (Volts)	
	c) LV (Volts	
19.14	Resistance	
	a) HV (Ohms)	
	b) IV (Ohms)	

19.15	Number of turns in		
	a) HV		
	b) IV		
	c) LV		
	d) Regulating		
19.16	Position of winding from the core(Enclose a sketch)		
	a) HV		
	b) IV		
	c) LV		
	d) Regulating		
19.17	Type of Conductor		
	a) HV		
	b) IV		
	c) LV		
	d) Regulating		
19.18	Maximum average radial compressive stress in the winding		
	a) For CTC/epoxy bonded conductor (N/sq.mm)		
	b) For paper insulated conductor (N/sq.mm)		
19.19	Insulation system		
	Min^{m} density of press board (gm/cc)		
	Min^{m} Density of paper (gm/cc)		
20.0	Insulation Level of Winding	HV	LV
20.1	Lightning impulse withstand voltage (kVp)		
20.2	Switching Surge withstand voltage (kVp)		
20.3	Power Frequency withstand voltage (kV rms)		
21.0	Short circuit withstand current & duration		
21.1	Short circuit current for which transformer is designed to withstand in p.u of rated rms current		
	(i). HV		
	(ii). IV		
	(iii). LV		
21.2	Withstand time for three phase short circuit at terminals (secs.)		
22.0	Capacitance Values		
22.1	HV to earth(pF)		

22.2	IV to earth(pF)			
22.3	LV to earth(pF)			
23.0	Tank			
23.1	Type of Tank cover (Conventional / Bell)			
23.2	Material			
23.3	Approximate thickness of			
	(i). Sides (mm)			
	(ii). Bottom (mm)			
	(iii). Cover (mm)			
23.4	Type of Tank cover joint			
24.0	Vacuum withstand capability of			
24.1	Main tank (torr)			
24.2	Radiators and accessories (torr)			
25.0	Pressure withstanding capability of			
25.1	Main tank (torr)			
25.2	Radiators and accessories (torr)			
26.0	Gasket			
26.1	Material			
26.2	Temperature withstand capability (°C)			
27.0	Size of oil filter hose (mm)			
28.0	Bushings	HV	LV (Cable Box)	N
28.1	Name of Manufacturer			
28.2	Rated Voltage (kV)			
28.3	Rated current (Amps)			
28.4	Total creepage distance (mm)			
28.5	Protected creepage distance (mm)			
28.6	Insulation Level			
	a) Lightning impulse withstand voltage (kVp)			
	b) Switching Surge withstand voltage (kVp)			
	c) Power Frequency withstand voltage (kV rms)			
28.7	Colour of porcelain			
28.8	Mounting			
29.0	Clearances			
29.1	Minimum clearance between phases and phase to earth			
	(i). In oil (mm)			
	(ii). In air (mm)			

29.2	Minimum clearance of HV winding to tank in oil (mm)	
29.3	Minimum clearance of HV winding to earth in oil (mm)	
29.4	Clearance between Core and Coil (mm)	
29.5	Clearance between coils (mm)	
29.6	Clearance between neutral to ground in air (mm)	
30.0	Tap changing Equipment rating	
30.1	Manufacturer & type designation	
30.2	Voltage class & current	
30.3	Number of steps	
30.4	Range	
30.5	Step voltage	
30.6	Electrical location of tapping (HV/IV/Neutral)	
30.7	No load voltage appearing on	
	(i). Principal tap	
	(ii). Maximum tap	
	(iii). Minimum tap	
31.0	Conservator	
31.1	Total volume (Litres)	
31.2	Volume between highest and lowest levels	
31.3	Air Cell (oil preservation)	
32.1	Material of air cell	
32.2	Continuous temp. withstand capability of the air cell	
33.0	Insulation oil	
33.1	Manufacturer of the Oil	
33.2	Standards applicable	
33.3	Type of oil (Non inhibited / inhibited)	
33.4	Moisture Content (ppm)	
33.5	Max. tan-delta value (at 90 deg. C.)	
33.6	Resistivity (ohm-cm)	
33.7	Breakdown Strength (kV)	
33.8	Interfacial tension at 20°C (min.)	
34.0	Temperature Indicators	
34.1	Oil Temperature Indicator	
	(i). Name of Manufacturer	
	(ii). Range	
35.0	Furnish details of processing of core coil assembly including drying method,	

	temperature, vacuum level, clamping pressure etc.	
36.0	Approximate dimensions	
36.1	Tank (L x B x H) (mm)	
36.2	Overall dimensions with coolers (L x B x H) (mm)	
36.3	Shipping dimensions (L x B x H) (mm)	
36.4	Height for un-tanking (mm)	
36.5	Dimensions of largest package (L x B x H) (mm)	
37.0	Weights of Transformer Components	
37.1	Core (kg)	
37.2	Windings (Kg)	
37.3	Core & winding assembly (kg)	
37.4	Insulation (Kg)	
37.5	Tank and fittings (Kg)	
37.6	Oil (Kg)	
37.7	Untanking weight (heaviest piece) (Kg)	
37.8	Total weight (Kg)	
37.9	Weight of heaviest package (Kg)	
37.10	Total shipping weight (Kg)	
37.11	Parts detached for transport (furnish list)	
38.0	Bimetallic Connections	
38.1	Normal current rating (A)	
38.2	Short time current rating (A)	
38.3	Tensile strength (Kg)	
38.4	Maximum temperature limit	
38.5	Dimensional sketch enclosed indicating tolerances (Yes/No)	
38.6	Minimum clearance (mm)	
	Phase to Phase	
	- Phase to Earth	
37.10	Total shipping weight (Kg)	
37.11	Parts detached for transport (furnish list)	
38.0	Bimetallic Connections	
38.1	Normal current rating (A)	
38.2	Short time current rating (A)	

38.3	Tensile strength (Kg)	
38.4	Maximum temperature limit	
38.5	Dimensional sketch enclosed indicating tolerances (Yes/No)	
38.6	Minimum clearance (mm)	
	- Phase to Phase	
	- Phase to Earth	

Place : _____

Signature & Seal of the Bidder

Date : _____

IV. G T P for 30 KVA DIESEL GENERATING SET
(To be filled in by the Bidder and shall be submitted with Technical Bid)

A. ENGINE:

1. Make:
2. Model No:
3. Type:
4. No. of Cylinders:
5. Arrangement of Cylinders:
6. Bore and stroke
7. RPM
8. Method of starting
9. Fuel injection type
10. Aspiration method
11. Lubricating oil system
12. Time required for starting from cold
13. Type of Governor
14. Fuel oil recommended
15. Lubricating oil recommended
16. LMP at site at output shaft/coupling
17. Over load capability
    - i) Full load
    - ii) Half load
    - iii) No load
18. Mechanical efficiency
19. Fuel Consumption per hour
    - i) Full load
    - ii) ¾ load
    - iii) ½ load
    - iv) No load
20. Standard mounting accessories on engine (furnished details as Annexure)
21. Safety shut downs provided
22. Direction of rotation
23. Type of cooling and sump capacity
24. Oil (type & Quantity)
25. Any other data

B. ALTERNATOR:

1. Make
2. Model No
3. Type
4. Governing specifications
5. a) Full load output in KVA
   b) Full load output in KW (at 0.8 PF)
6. Enclosure
7. Speed/frequency
8. No. of phases
9. Is neutral brought out
10. Voltage between phase/neutral
11. Regulated band of voltages
12. Current carrying capacity of winding.
13. Percentage imbalance permissible
14. Permitted over load capacity(maximum)
15. Short time over load
16. Efficiency
17. Temporary over load after full load run for 12 hours
18. Excitation method
19. Excitation amps at full load
20. Excitation Voltage
21. Air gap between stator and rotor
22. Exciter type

C. GENERAL:

1. Length of set (overall) &width (overall)
2. Weight of set (overall)
3. Head room needed for lifting/servicing
4. Weight of Alternator
5. Weight of engine
6. Direction of rotation
7. Standard accessories
8. Radiator (make and type)
9. Fan dia
10. CFM of fan and static pressure

11. RPM of fan/type of drive.
12. HP absorbed by fan.
13. Capacity of daily service tank.
14. Size of service tank.

PLACE: _____ Signature & Seal of Bidder

DATE: _____

V. G T P for RELAYS
(To be filled in by the Bidder and shall be submitted with Technical Bid)

A: BACK-UP OVER CURRENT AND EARTH FAULT RELAY

1. Make
2. Type
3. Auxiliary Supply Voltage
4. C.T. Secondary current
5. P.T. Secondary voltage
6. Rated Frequency
7. Display
8. Communication ports
9. Communication protocol
10. Software
11. Ingress protection level
12. Inbuilt protection:

    a. Undercurrent protection (37) Y/N
    b. Negative Sequence Over current protection (46) Y/N
    c. Broken Conductor protection (46BC) Y/N
    d. Negative sequence overvoltage protection (47) Y/N
    e. Thermal overload protection (49) Y/N
    f. Ground fault protection (50/51N) Y/N
    g. 3 phase over current protection (50/51P) Y/N
    h. Circuit breaker failure protection (50BF) Y/N
    i. Voltage controlled over current protection (51V) Y/N
    j. Over/Under voltage protection (59/27) Y/N
    k. Residential over voltage protection (59N) Y/N
    l. Residential earthfault protection (64) Y/N
    m. Ground fault directional protection (67N) Y/N
    n. Wattmetric earthfault protection (67W) Y/N
    o. Autoreclose (79) Y/N
    p. Under/Over frequency protection (81) Y/N
    q. Rate of change of frequency (81R) Y/N
    r. Lock-out (86) Y/N

s. Current transformer supervision (CTS) Y/N

t. Switch on to fault (SOTF) Y/N

u. Trip circuit supervision (TCS) Y/N

v. Voltage Transformer supervision (VTS) Y/N

B: DISTANCE PROTECTION RELAY

1. Make
2. Type
3. Type of distance measuring elements
4. Range of settings (in secondary ohms) for Zone-I, Zone-II, Zone-III, Zone-IV & Zone-V.
5. Operating times:

   i. First Zone timing.

   ii. Second zone timing adjustable between ___ secs to ____ secs

   iii. Third zone timing adjustable between ___ secs to ____ secs

   iv. Fourth zone timing adjustable between ___ secs to ____ secs

   v. Fifth zone timing adjustable between ___ secs to ____ secs

6. Contacts rating:

   i. First Zone

   ii. Second zone

   iii. Third zone

   iv. Fourth zone

   v. Fifth zone

7. VA burden:

   i. Current circuit of the scheme

   ii. Potential circuit of the scheme

8. Auxiliary DC voltage
9. Detailed literature submitted. V.

COMMUNICATION:

1. Whether IEC 61850 compliance protocol
2. Serial port RS 232
3. Any other port provided
4. Whether protocol converter provided between IEC 61850 and existing protocol IEC 60870

C: LOCAL BREAKER BACK-UP (LBB) RELAY:

1. Make
2. Type
3. Current coil rating
4. Trip setting
5. Operating time
6. Reset time
7. Dropout / Pick-up
8. C.T. Burden
9. Auxiliary Burden
10. Control Contact
11. Time Accuracy
12. Auxiliary Supply
13. Contact Rating Trip Duly
14. Operational Indicators
15. Thermal withstand capacity
16. List of tests conducted on the relay.

Place : _____ Signature & Seal of the Bidder

Date : _____

VI. G T P for TIME SYNCHRONIZING EQUIPMENT:
(To be filled in by the Bidder and shall be submitted with Technical Bid)

1	Manufacturer or Trader
2	If Manufacturer, in-house or licensed technology
3	Is the Company ISO 9001:2000 qualified for GPS-TSE (Attach copy of certification
4	GPS-TSE antenna
4a	Environmental Specifications: i) Operating Temp ii) Storage Temp. iii) Humidity iv) Waterproof
4b	Technical Specifications i) Operating Temp ii) Storage Temp. iii) Humidity iv) Waterproof
4c	Physical Specifications i) Antenna Weight ii) Mounting pole height
4d	Cable Specifications i) Type ii) Impedance iii) Connectors iv) Signal Attenuation v) Length of cable
5	GPS receiver
5a	Technology (SMT or any other)

5b Specifications of GPS receiver:

i) Frequency

ii) No. of satellites
iii) Time accuracy of PPS
iv) Acquisition time - Hot Start
v) Acquisition time - Warm Start
vi) Acquisition time - Cold Start
vii) Battery Backup

6 Time Code Signal Generator

6a Specifications of Time code generator

i) Timing Accuracy

ii) Display of Time

iii) Local Display – No. of Lines & Characters,
LCD back lit
iv) Keyboard

6b IRIG-B Output

i) IRIG-B AM modulated
ii) IRIG B PWM modulated

6c RS-232 /RS 485/RS-422 &
Ethernet output

6d Pulse Outputs :
Buffered PPS
(for calibration purposes only),
Minute Pulse, 15-minute pulse,
30 minute pulse,
60 – minute pulse

6e Relays for Potential free contacts:

i Solid State
ii) min. 100 mA at 220 VDC

7 Front Panel Visual Indications

i) GPS LOCKED
ii) GPS FAIL
iii) RTC ON

8 Distant View Display (DVD)
i) Signal interface with Time Code Signal Generator RS-422/ RS- 485/RS-232
ii) Display Size
iii) Display type
iv) Display Format -Time
Display Format - date
v) Updation rate
vi) Supply

9 Power Supply
i) DC – Min & Max

10 Synchronization Software
i) Interface with PC – USB
ii) Compatibility with Windows XP and higher OS

11 Compliance for networking protocols
i) NTP
ii) SNTP
iii) TCP/IP

12 Synchronization of IEC 61850 compliant devices using SNTP

13 Compliance for Internet protocol IP v4

14 *Type Tests*
(a) Accuracy Test
(b) Bump test
(c) Vibration test
(d) Shock Test
(e) Dry Heat test
(f) Cold Test
(g) Damp heat cyclic test
(h) Radiated Emission test
(I) Electrostatic discharge immunity test
(J) Electrical fast transient

(k) High frequency surge test
(l) Radiated susceptibility test
(m) Conducted RF Immunity test
(n) 1 M Hz burst test
(o)Voltage dips, short interruptions and variations immunity test
(p) Dielectric strength
(q) Power frequency magnetic field immunity test.

15 Special Features

i)Short circuit protection
ii)Feed line fault protection

Place : _____

Date : _____

Signature & Seal of Bidder

VII. G T P for CONTROL CABLES.
(To be filled in by the Bidder and shall be submitted with Technical Bid)

For the Type & Size of: _____

1. Guarantee Period
2. Make
3. Type (AS PER IS 1554 Part-1)
4. Voltage Grade (KV)
5. Maximum Conductor temperature
6. Continuous (º C)
7. Short time (º C)
8. Conductor
9. Size (mm^2)
10. No. of wires in each conductor
11. Dia of wires in each conductor before compaction (mm)
12. Shape of Conductor
13. Maximum Conductor resistance At 20º C (Ohm/Km)
14. Insulation
15. Core Identification
16. Inner Sheath
17. Galvanised Steel Armour
18. Short circuit current for 1 sec of conductor (KAmp)
19. Electrical Parameters at Maximum Operating temperature
20. Resistance (Ohm/Km) (AC Resistance
21. Reactance at 50 C/s (Ohm/Km)
22. Impedance (Ohm/Km)
23. Capacitance
24. (Micro farad / KM)

Place : _____

Date : _____ Signature & seal of Bidder

VIII. GT P for NITROGEN INJECTION SYSTEM:
(To be filled in by the Bidder and shall be submitted with Technical Bid)

Sl. No.	Description	Guaranteed Particulars
1	Name of Manufacture and country of origin	
2	Reference standards	
3	Details of system equipments	
4	**FEC (Fire Extinguishing Cubicle)**	
4.1	Dimensions (LXBXH) mm	
4.2	Weight	
4.3	Capacity of Nitrogen cylinder	
4.4	Number of cylinders	
4.5	Pressure of Nitrogen filling	
4.6	Minimum distance of FE cubicle from the transformer	
4.7	Method of mounting	
4.8	Whether the following items are provided in FE cubicle. If so furnish make, type & other details	
4.9	Contact Manometer	
4.10	Pressure Regulator	
4.11	Oil Release Unit	
4.12	Oil drain assembly	
4.13	Pressure / limit switches	
4.14	No. of contacts & spare contacts (NO & NC)	
4.15	Oil drain Valve (ABOVE FEC)	
4.16	Make	
4.17	Type	
4.18	Size	
4.19	Type of metal	
5	**Nitrogen Injection Valve (Above FEC)**	
5.1	Make	
5.2	Type	
5.3	Size	
6	**Oil drain pipe**	
6.1	Size	
6.2	Length	
6.3	Number of openings in the transformertank	
6.4	Material	
7	**Control Box**	

7.1	Dimensions (LXBXH) mm	
7.2	Type & Thickness of sheet steel	
7.3	Details of components provided in thecontrol box	
7.4	Control voltage	
7.5	Method of mounting	
7.6	Whether audio and visual alarm provided?	
8	**Transformer Conservator Isolation Valve**	
8.1	Make	
8.2	Type	
8.3	Location	
8.4	Whether suitable for pipe of size 80 mm dia	
8.5	No. of contacts & spare contacts (NO & NC)	
8.6	Padlocking provision	
9	**Detectors**	
9.1	Make	
9.2	Type	
9.3	Quantity required	
9.4	Method of fixing	
9.5	Effective heat sensing area	
9.6	Temperature recommended for effective heat Sensing	
9.7	Number of contacts NO / NC	
9.8	Necessity and condition of Refilling	
10	**Whether approved by Tariff Advisory Committee of India**	
11	**Technical Particulars For Nitrogen Injection System For Prevention Of Transformer Explosion**	
12	**Power Supply**	
12.1	Control box	
12.2	FEC (lighting)	
12.3	Extinction period	
12.4	On system activation	
12.5	On commencement of Nitrogen injection	
13	FEC Suitable for capacity	
13.1	Dimensions (LXBXH) mm	
13.2	Weight	
13.3	Nitrogen cylinder capacity	
14	**Control Box**	
14.1	Dimensions (LXBXH) mm	

14.2	Weight	
15	**Detectors**	
15.1	Heat sensing temperature	
15.2	Time of Operation	
16	For system activation	
16.1	Transformer Tank Explosion Prevention	
16.2	Fire Extinction	
17	For reduction of pressure in Tank by Nitrogen release	
17.1	Transformer Tank Explosion Prevention	
17.2	Fire Extinction	
18	Any other technical details not covered above	

Place :_____

Date : ..... Signature & Seal of Bidder.

SECTION – III

PRICE SCHEDULES

Schedule 1

Supply of Plant & Equipment for Renovation & Up gradation
of protection system of 132KV S/S in Mizoram:

(All prices are in Indian rupees only)

Sl. No.	Description	Unit	Provisional Qty.	Unit Rate (Inclusive of taxes & F&I destination)	Total Cost (4x5)	Amount of F&I loaded under Col. 6 (item-wise)	Mode of Transaction (Direct/Bought-out items)
1	2	3	4	5	6	7	8
1	110V Battery Bank	Set	16				
2	110V Battery Charger	Set	16				
3	DCDB for 110V	No	16				
4	48V Battery Bank	Set	16				
5	48V Battery Charger	Set	16				
6	DCDB for 48V	No	16				
7	Transformer, 250kVA,33/0.415KV	No	2				
8	D.G. Set (30 kVA Rating)	No	3				
9	Back Up O/C & E/F Relay	No	24				
10	Distance Relay	No	2				
11	LBB Relays	Set	21				
12	Tool Kits for above Relays	No	8				
13	Time Synchronizing Equipment	No	8				
14	Control Cable:-						
	▪ 14C X 2.5 Sq.mm	Mtr	3,830				
	▪ 10C X 2.5 Sq.mm	Mtr	4,650				
	▪ 7C X 2.5 Sq.mm	Mtr	5,430				
	▪ 5CX2.5 Sq.mm	Mtr	3,720				
	▪ 3.5CX35Sq.mm	Mtr	1,100				
	▪ 4C X 16 Sq.mm	Mtr	2,700				
	▪ 4C X6 Sq.mm	Mtr	1,650				
	▪ 2C X 6 Sq.mm	Mtr	4,000				
	▪ 2C x 4 Sq.mm	Mtr	2,480				
15	Nitrogen Injection system	No	16				
Total							

(Rupees_____) only

Place :
Date :

Signature:
Printed Name:
Designation with seal:

Schedule 2

Installation/Erection of Plant & Equipment for Renovation & Up gradation of protection system of 132KV S/S in Mizoram

(All prices are in Indian rupees only)

Sl.No.	Installation/ erection of -	Unit	Provisional Qty.	Unit Rate	Total installation/ erection Cost (4x5)	Remark, if any.
1	2	3	4	5	6	7
1	110V Battery Bank	Set	16			
2	110V Battery Charger	Set	16			
3	DCDB for 110V	No	16			
4	48V Battery Bank	Set	16			
5	48V Battery Charger	Set	16			
6	DCDB for 48V	No	16			
7	Transformer, 250kVA,33/0.415KV	No	2			
8	D.G. Set (30 kVA Rating)	No	3			
9	Back Up O/C & E/F Relay	No	24			
10	Distance Relay	No	2			
11	LBB Relays	Set	21			
12	Tool Kits for above Relays		- Not to be quoted -			
13	Time Synchronizing Equipment	No	8			
14	Control Cable:-					
	▪ 14C X 2.5 Sq.mm	Mtr	3,830			
	▪ 10C X 2.5 Sq.mm	Mtr	4,650			
	▪ 7C X 2.5 Sq.mm	Mtr	5,430			
	▪ 5C X 2.5 Sq.mm	Mtr	3,720			
	▪ 3.5C X35 Sq.mm	Mtr	1,100			
	▪ 4C X 16 Sq.mm	Mtr	2,700			
	▪ 4C X6 Sq.mm	Mtr	1,650			
	▪ 2C X 6 Sq.mm	Mtr	4,000			
	▪ 2C x 4 Sq.mm	Mtr	2,480			
15	Nitrogen Injection system	No	16			
Total						

(Rupees_____) only

Place :
Date :

Signature:
Printed Name:

Designation
with seal:

Schedule – 3

Bidder's Name and Address:

GRAND SUMMARY

(All prices are in Indian rupees only)

Sl.No.	Description	Total Price
1	TOTAL SCHEDULE NO. 1 (Supply of Plant and equipment)	
2	TOTAL SCHEDULE NO. 2 (Installation/Erection charges)	
3	Grand Total (1+2)	

(Rupees_____) only

Place :
Date :

Signature:
Printed Name:

Designation
with seal: