

SECTION - XI**GUARANTEED TECHNICAL PARTICULARS**

Schedule No.	Name of equipment
1.	Generators
2.	Control, Protection and Metering
3.	415 V Switchgear
4.	110 V Batteries
5.	33 kV Vacuum Circuit Breakers
6.	33 kV Potential Transformers
7.	33 kV Current Transformers
8.	Control/Relay Panels
9.	Earthing and Lightning Protection
10.	Power House Lighting

SCHEDULE - 1

**GUARANTEED TECHNICAL PARTICULARS
SYNCHRONOUS GENERATORS**

To be filled by tenderer

1. Name of manufacturer.
2. Type of reference.
3. Shaft orientation.
4. Speed and direction of rotation.
5. (a) Normal voltage between phases
(b) Voltage variation
6. (a) Frequency
(b) Frequency variation
7. (a) Guaranteed rated output at rated conditions
with temperature as mentioned in the specifications.
(b) Guaranteed Overload capacity
8. Rated power factor.
9. Guaranteed maximum temperature rise for output
guaranteed in item 7 above over cooled
air/ambient temperature with cooling water temperature
not exceeding.....30.....° C.
10. Guaranteed maximum temp. rise for the output
guaranteed in item 9 above over cooled
air/ambient temperature with cooling
water temperature not exceeding:
 - (a) Stator Winding by ETD
 - (b) Rotor Winding by resistance
 - (c) Bearing by ETD
11. Guaranteed overall efficiency of generator at
rated voltage, p.f. frequency and 75°C winding

temperature computed by the summation of losses method in accordance with IS:4889 – 1968 subject to tolerance in IS:4722 – 1968.

- (a) Full load
 - (b) 80% full load
 - (c) 60% full load
 - (d) Weighted average efficiency
12. Inherent regulation, i.e., increase in voltage at constant speed and excitation on taking off.
- (a) Full load
 - (b) 80% full load
 - (c) 60% full load
13. Generator Reactances:
- (a) Synchronous Reactance (saturated)
 - (i) Direct axis
 - (ii) Quadrature axis
 - (b) Direct axis transient Reactances
 - (i) Saturated
 - (ii) Quadrature axis
 - (c) Sub-transient Reactances
 - (i) Direct axis
 - (ii) Quadrature axis
14. Negative phase sequence Reactance.
15. Zero phase sequence Reactance.
16. Resistance of armature winding per phase.
17. Resistance of field winding.
18. Generators time constants
- (i) Direct axis transient open circuit
 - (ii) Direct axis transient short circuit
19. Generator characteristic curves

- (i) Open circuit saturation curve
 - (ii) Short circuit saturation curve
 - (iii) Full load saturation curve at rated power factor
20. Short circuit ratio
21. Synchronizing power at kV full load, 50 Hz, p.f. (lagging)
22. Flywheel effect of
- (a) The rotating parts of the generator
 - (b) Flywheel (if any)
23. Duration for which all parts are guaranteed to withstanding safely maximum runaway speed.
24. Guaranteed minimum factor of safety based on yield point of material under runaway/short circuit conditions and name and location of part having the minimum factor of safety.
25. Maximum I_2^2t
26. Inertia constant.
27. Maximum runaway speed which all parts are guaranteed to withstand for 15 minutes.
28. Embedded Temperature Detectors
- (a) Number
 - (b) Type
29. Excitation Equipment
- (a) Name of the manufacturer
 - (b) Type
 - (c) Accuracy of voltage regulation
 - (d) Range of voltage level setting
 - (e) Range of compounding/reactance

- drop compensation
 - (f) Range of control in auto mode
 - (g) Range of control in manual mode
 - (h) Frequency range of operation
 - (i) Excitation power feed
 - (j) Maximum continuous current rating
 - (k) Nominal voltage
 - (l) Celling voltage
 - (m) Response ratio
 - (n) Ambient temperature
 - (o) Protection glass of excitation cubicles
30. Field current for full load on generator at rated power factor and terminal voltage.
31. Stator
- (a) Material of stator core
 - (b) Insulation of laminations
 - (c) Number of sections in which stator is divided for transport
 - (d) Insulation of winding
 - (e) maximum temperature rise
32. Rotor
- (a) Construction of field poles
 - (b) Method of attaching field poles
 - (c) Rotor material and construction
 - (d) Field winding construction
 - (e) Insulation of field winding
 - (f) Construction of damper winding
 - (g) Air gap
 - (h) Diameter of assembled rotor
 - (i) Factor of safety at maximum runaway speed based on yield point of material
 - (j) Maximum temperature rise of field winding when operating at rated conditions
33. Generator Cooler (if applicable)
- (a) Number of air coolers
 - (b) Number of oil coolers
 - (c) Cooling water requirement
 - (d) Cooling water pressure

34. Bearings
 - (a) Type
 - (b) Number of bearings
 - (c) Bearing oil specification
 - (d) Quantity required for first filling

35. Generator Brakes
 - (a) Air pressure for satisfactory operation
 - (b) Speed at which brakes are applied

36. Main Shaft
 - (a) Material
 - (b) Details of coupling flange
37. Weight of generator rotating parts

38. Weight of complete generator

39. Current Transformer
 - (a) Type
 - (b) Name of manufacturer
 - (c) Rated transformation ratio
 - (d) Output at rated current and accuracy
 - (e) Accuracy class
 - (f) Rated over current factor
 - (i) Times rated current
 - (ii) Time in seconds
 - (g) Knee point voltage
 - (h) Basic insulation level
 - (i) Winding temperature rise
 - (j) Secondary winding resistance

40. Neutral Grounding Equipment
 - (i) Distribution Transformer and secondary Resistor
 - (a) Type
 - (b) Name of manufacturer
 - (c) Voltage ratio

- (d) Continuous rating
 - (e) One minute rating
 - (f) Secondary load resistance (ohms)
 - (g) Current rating of resistor
 - (h) Duty cycle of resistor and cooling medium
 - (i) Overall dimensions and weight
- (ii) Neutral Isolation Switch
- (a) Type
 - (b) Name of manufacturer
 - (c) Voltage rating, frequency
 - (d) Normal current
 - (e) Short time rating
 - (f) 1.2/50 Micro Second impulse level
 - (g) 1 minute power frequency dry withstand voltage
 - (h) Dimensions and weight
41. Heaviest package for shipment
- (a) Name
 - (b) Weight
 - (c) Dimensions (L x B x H)
42. Largest package for shipment
- (a) Name
 - (b) Weight
 - (c) Dimensions (L x B x H)
43. Heaviest assembly to be lifted by power house crane
- (a) Name
 - (b) Weight
 - (c) Dimensions (L x B x H)

SCHEDULE-2

**GUARANTEED TECHNICAL PARTICULARS
CONTROL, PROTECTION AND METERING**

A.	CONTROL SYSTEM	To be filled by tenderer
1	Control components and their parameters & makes	
2	No. of inputs	
	a. Digital	
	b. Analogue	
	c. Provision for spares	
3	No. of outputs	
	a. Digital	
	b. Analogue	
	c. Provision for spares	
4	Start/stop operation	
	a. Local Manual	
	b. Local Automatic	
5	Mimic diagram display	
	a. Electrical System	
	b. Hydraulic System	
6	Mode of control	
	a. Level control	
	b. Speed control	
	c. Flow control	
	f. Sequence control	
	g. Step by step control	
7	Temperature measurement	
	a. Make of the scanner	
	b. Holding capacity	
	c. Time for scanning cycle	
	f. Alarm setting range	

	g. No. of setting levels	
8	Generator, transformer & feeder control panels	
	a. Ammeter	
	b. Voltmeter	
	c. MW meter	
	d. MVAR meter	
	e. Power factor meter	
	f. Frequency meter	
	g. DC ammeter for field current	
	h. DC voltmeter for field voltage	
9	Transducers	
	a. Make	
	b. Output	
	c. Accuracy class	
	B. ALARM & ANNUNCIATION SYSTEM	
1	Make	
2	Type	
3	Wattage of window indicating lamp	
4	Wattage of a set of windows	
5	Interface with auto control system	
6	Adjustable range of cut-off time, if unacknowledged	
7	No. of active windows	
8	No. of spare windows	
9	Response time	
10	UPS arrangement	
11	Dimension of each windows	
12	Dimensions of a set of window	
13	Over all dimensions of annunciation panel	
	C. ENERGY METERING SYSTEM	
1	Make	
2	Type	

3	CT/PT connection direct or through transducers	
5	Accuracy of meters	
6	Accuracy of transducers, if any	
7	Parameters measured	
8	Maximum current rating for 1 second	
9	Service voltage range and tolerance	
10	Service frequency range and tolerance	
11	Service temperature range	
12	Power consumption	
	a. Current circuit	
	b. Voltage circuit	
13	Service life	
14	Protection against electromagnetic/radio interference	
	D. PROTECTION SYSTEM	
1	Make	
2	Type of numerical relays their functions	
	a. For Generators	
	b. For transformers	
3	Built in testing facility	
4	Methodology to provide redundancy	
5	Type of back-up protection in case of failure of numerical relays	
	a. For generators	
	b. For transformers	
6	Parameter/command documentation	
7	Maximum operating time	
8	Sensitivity in %age of rated current	
9	ANALOGUE INPUT VARIABLES	
	a. Rated frequency	
	b. Rated current	
	c. Thermal rating of current circuits	
	i. Continuous	

	ii. For 10 seconds	
	iii. For 1 second	
	iv. Dynamic	
10	Rated Voltage	
11	Thermal rating of voltage circuits (continuous)	
12	Burden per phase	
	a. At rated current	
	b. At rated voltage	
13	CURRENT TRANSFORMER REQUIREMENTS	
	a. Generator Protection	
	i. VA burden	
	ii. Saturation factor	
	iii. Minimum knee point voltage	
	iv. Maximum excitation current	
	b. Transformer Protection	
	i. VA burden	
	ii. Saturation factor	
	iii. Minimum knee point voltage	
	iv. Maximum excitation current	
	c. Feeder Protection	
	i. VA burden	
	ii. Saturation factor	
	iii. Accuracy class	

**GUARANTEED TECHNICAL PARTICULARS
415 VOLT SWITCHGEAR**

Sl. No.	Particulars	To be Filled in by Tenderer	
1.0	BUS BAR		
1.01	Type		
1.02	Rated Voltage		
1.03	No. of Phases		
1.04	Frequency		
1.05	System Earthing		
1.06	Continuous current rating within the cubicle at 50°C ambient.		
1.07	Short time current rating for (1) Sec.		
1.08	Temperature rise of bus bar joints under normal working conditions at rated current and at 50°C Ambient.		
1.09	HV withstand test voltage for (1) minute.		
1.10	Minimum clearances. i) Phase to phase ii) Phase to earth		

1.11	Insulation to Bus Bar. Size of bus bar.		
2.00	BUS SUPPORT INSULATOR:		
2.01	Type & Service.		
2.02	Material		
2.03	Voltage Class		
2.04	HV withstand test for one (1) minute.		
3.00	CIRCUIT BREAKER:		
3.01	System		
3.02	Service		
3.03	Type		
3.04	Pole		

3.05	Rated Service Voltage		
3.06	One (1) minute power frequency withstand voltage.		
3.07	Rated continuous current at 50°C and within the cubicle.		
3.08	Short time current for one (1) Sec.		
3.09	Rated breaking capacity.		
3.10	Rated breaking current. a) Symmetrical b) Asymmetrical		
3.11	Rated making capacity		
3.12	Operating mechanism		
3.13	Tempt. rise above 50°C		
3.14	Operating duty		
3.15	AUXILIARY VOLTAGE:		

	<ul style="list-style-type: none"> i) Closing ii) Tripping iii) Spring charging motor iv) Space heater & lamp 240 VAC, 50 Hz 		
3.16	Mounting		
4.00	CURRENT TRANSFORMER:		
4.01	System		
4.02	Service		
4.03	Type		
4.04	Rated voltage		
4.05	Quantity		
4.06	Power frequency withstand voltage.		
4.07	Mounting		

4.08	Rated short time current for one (1) Sec.		
4.09	Current ratio and accuracy.		
5.00	MAGNETIC CONTACTOR (AC):		
5.01	Service		
5.02	Poles		
5.03	Rated voltage		
5.04	Frequency		
5.05	Continuous current rating		
5.06	Power frequency test voltage		
5.07	Short time current rating		
5.08	Over load protection.		
5.09	Control circuit voltage		

5.10	Operation Indicator		
5.11	<p>AUXILIARY CONTACT:</p> <p>i) Normally closed</p> <p>ii) Normally open</p> <p>iii) Breaking capacity</p>		
5.12	<p>CONTACTOR COIL RATING:</p> <p>i) Pick-up</p> <p>ii) Drop out</p>		
5.13	Temperature rise limit for magnetic coil.		
5.14	Temperature rise limit for power circuit and other accessories.		
5.15	Duty class		
5.16	Utilization category		

GUARANTEED TECHNICAL PARTICULARS**48 V 300 AH BATTERY & CHARGER**

Sl. No.	Items	Specified Value, if any	To be filled by tenderer
A.	BATTERIES	48 V 300 AH	
1.	Manufacturers name		
2.	Capacity of battery at 10 hr discharge rate	Amp. hr.	
3.	Cells Cell designation according to IS:1651-1970 Method of connection between cells whether bolted or soldered Distance between the centre of cells when erected Overall dimension of the cells Weight of cell complete with KOH	Cm Cm Kg	
4.	Type and material of cover		
5.	Cell insulators(whether provided)		
6.	Container Material of container Thickness of container Whether container is moulded type		
7.	Separator Type and material Thickness of separator in mm		
8.	Plates Type of positive plate & dimensions in cms. Type of negative plate & dimensions in cms.		

9.	Clearances Clearance between edges of plate and inner surface of container Clearance between bottom of negative plate and bottom of container Clearance between top of the plate and top of the container	Cm Cm Cm	
10.	Electrolyte Amount and specific gravity of electrolyte required for first filling Recommended specific gravity at the end of full charge Expected specified gravity at the end of discharge at 10 hr. rate Max. electrolyte temperature which cell can stand Continuously Short time	°C °C	
11.	Voltage per cell at the end of charge at finishing rate	V	
12.	Capacity of battery in Amp. hrs. at 27°C At 10 hr. rate of discharge At 3 hr. rate of discharge At 1 hr. rate of discharge At 1 minute rate of discharge	AH AH AH AH AH	
13.	Voltage of the battery at the end of discharge at: At 10 hr. rate of discharge At 3 hr. rate of discharge At 1 hr. rate of discharge at 1 minute rate of discharge	V V V V	

14.	Recommended charging rates of the battery Starting rate of charge Finishing rate of charge	Amp. Amp.	
15.	Recommended trickle charging rate	Amp.	
16.	How long the battery can remain uncharged without any deterioration in active material before first charge is given		
17.	Maximum discharge current of battery (with reference to time as per para 18 below)		
18.	Time for which max. current as referred above can be continuously drawn such that voltage does not fall below 10% of rated voltage	Hr.	
19.	Nominal watt-hour efficiency of the battery at 10 hr. rate	%	
20.	Nominal amp. hr. efficiency of battery at 10 hr. rate	%	
21.	Type of wood used for battery stand		
22.	Type of paints used		
23.	Size and material of insulators		
B.	FLOAT & BOOST CHARGER FOR BATTERY		
1.	Rectifiers and filters Type and make Material and construction of rectifier Power rating Peak inverse voltage Current rating Type of filters and ripple factors	Watts V	

2.	Automatic voltage regulator (A.V.R.) Type of AV.R. Regulating bank Auto-setting rate of A.V.R. When set to trickle charging When set to boost charging Manual control range Sensitivity of A.V.R.		
3.	Transformer V.A. rating of transformer Transformation ratio		
	and taps Type of connection Type of overload device		
4.	Instruments Ammeter range Voltmeter range		
5.	Miniature circuit breaker Rated normal current carrying capacity Rated short circuit current capacity No. of auxiliary contacts for alarm and annunciation		
6.	Type of alarm and annunciation arrangement for over voltage under voltage and grounded bus conditions		
7.	Alarm and annunciation scheme for HRC fuses		
C.	D.C. Distribution Board		
1.	D.C. Bus Bars Current rating of	Amp.	
	positive bus Current rating of negative bus Type & class of insulator	Amp. Amp.	

2.	Incoming Circuits No. of moulded case circuit breaker and their normal and short circuit current rating Outgoing circuits No. of MCB Normal rating Short circuit current rating		
3.	Selector switches Current rating of the switches Current rating of auxiliary contacts		
4.	Type and range of the ammeter		
5.	Voltmeter range		
6.	Alarm and annunciation scheme for HRC fuses		

GUARANTEED TECHNICAL PARTICULARS
33 kV CIRCUIT BREAKERS

Sl. No.	Particulars	As specified	As offered
1.	Name of manufacturer		
2.	Manufacturer's type designation		
3.	Type		
4.	Standards followed		
5.	Suitable for outdoor duty		
6.	Rated voltage (kV)		
7.	No. of poles of circuit breaker		
8.	Continuous current rating (A) i. Under normal conditions (amps) (at °C) ii. Under site conditions (Amps)		
9.	Short time current rating i. 1 second kA (rms) ii. 3 seconds kA (rms)		
10.	Maximum temperature rise over ambient of different parts °C.		
11.	Breaking capacity i. Symmetrical kA rms ii. Asymmetrical Ka		
12.	Making capacity kA (peak)		
13.	Kilometric fault level (MVA)		
14.	Maximum interrupting capacity under phase opposition condition MVA		
15.	Maximum line charging current braking capacity without over exceeding 2.5 to 3 times the rated phase to neutral voltage		
16.	Maximum line charging current breaking capacity and corresponding over voltage recorded in test		
17.	Total break time (measured from instant of trip coil energization)		
18.	Arcing time (ms)		
19.	Make time (ms)		
20.	Dry and wet 1-minute power frequency withstand test voltage for complete circuit breaker i. between phase to phase kV (rms) ii. between phase to ground kV (rms)		
21.	1.2/50 micro-second full wave impulse withstand voltage for complete circuit breaker i. between phase to phase kV (peak) ii. between phase to ground kV (peak)		
22.	Dry 1-minute power frequency withstand voltage for insulator Kv (rms)		
23.	1.2/50 micro-second full wave impulse withstand		

	voltage for the insulators, kV (peak)		
24.	Creepage distance to ground, mm i. between phase ii. live parts to earth iii. live parts to ground level		
25.	Number of break per phase		
26.	Total length of break per phase, mm		
27.	Rate of contact travel, mm/sec		
28.	Type of main contacts		
29.	Type of auxiliary contacts		
30.	Material of auxiliary contacts		
31.	Main contact silver plated or not, if yes, thickness of silver plating		
32.	Number of trip coils in each breaker		
33.	Number of auxiliary contact provided Those closed when breaker is closed. Those open when breaker is closed. Those adjustable w.r.t. the position of main contact. Rating and braking capacity of each contact.		
34.	Type of operating mechanism Opening Closing Emergency tripping		
35.	Control cum circuit volt. For close/trip coil (volt)		
36.	Power required for closing/trip coil (watt)		
37.	Duty cycle		
38.	Anti-pumping device		
39.	Weight of 3 phase CB complete with operating mechanism, bushing, framework etc.		
40.	Overall dimensions (mm x mm x mm)		
41.	Confirm that all details given in technical particulars are acceptable to tenderer		
42.	If answer is No in 41, indicate point wise deviation		
43.	Manufacture's catalogue enclosed		

GUARANTEED TECHNICAL PARTICULARS
33 kV POTENTIAL TRANSFORMERS

S. No.	Particulars	As specified	As offered
1.	Manufacturer's name, type & designation		
2.	Type		
3.	Rated voltage	33	
4.	Rated primary voltage (kV)		
5.	Rated secondary voltage (kV) Winding I Winding II		
6.	Rated burden (VA) Winding I Winding II		
7.	Accuracy class Winding I Winding II		
8.	Maximum ratio error with rated burden and 5% normal primary voltage		
9.	Maximum ratio angle error with rated burden and 5% normal primary voltage		
10.	Variation in ratio and phase angle error for variation in Voltage by 1°C Frequency by 1Hz		
11.	Temperature rise at 1.1 times rated voltage with rated burden		
12.	Rated voltage factor and time		
13.	1.2/50 micro second impulse wave withstand test voltage (kV peak)		
14.	One minute power frequency withstand test (dry) voltage kV rms		
15.	One minute power frequency withstand test (wet) voltage kV rms		
16.	One minute power frequency withstand voltage on secondaries (kV rms)		
17.	Minimum creepage distance (mm) Moderately polluted atmosphere Heavily polluted atmosphere i. Total ii. Protected		
18.	Whether corona shield provided or not		
19.	Total weight (kg)		
20.	Overall dimensions		
21.	Mounting details		

GUARANTEED TECHNICAL PARTICULARS
33 kV CURRENT TRANSFORMERS

Sl. No.	Particulars	As specified			As offered
1.	Name of manufacturer				
2.	Manufacturer's types designation				
3.	Type				
4.	Standards followed				
5.	Rated voltage (kV)				
6.	Rated primary current				
7.	Rated secondary current				
8.	Number of cores: Core I Core II Core III	Rated output	Class of accuracy	Accuracy limit factor	
9.	Short time current rating: i. 1 seconds kA (rms) ii. 3 seconds kA (rms)				
10.	Dynamic current kA (peak)				
11.	Temperature rise over max. ambient °C: i. Oil at top of housing (°C) ii. Winding (°C)				
12.	Class of insulation				
13.	Current voltage and phase errors at rated burden and frequency				
14.	Confirm that all particulars given in technical data sheet are acceptable				
15.	If answer is 'NO' in 14 indicate point wise deviation				

GUARANTEED TECHNICAL PARTICULARS
CONTROL AND RELAY PANELS

Sl. No.	Particulars	As specified	As offered
1.	Make		
2.	Type		
3.	Reference standard		
4.	Construction Degree of protection Sheet metal thickness mm Floor channel sills, vibration damping pads and kick plate furnished?		
5.	Equipment mounting All relays, meters and switches are flush mounted? Relays furnished in draw out cases with built-in test facilities?		
6.	Name plate Material Thickness Size for :- Equipment Panels		
7.	Internal illumination Volt Watt Door switch controlled		
8.	Space heater Volt Watt Thermostat controlled?		
9.	Plug socket Type Rating		
10.	Panel illumination, space heater and plug socket circuits provided with individual switch fuse units?		
11.	Internal wiring Wire type Voltage grade Conductor material Conductor size for i. Current/control circuit ii. Voltage circuit e. Wires identified at both ends with ferrules?		
12.	Terminal block Make Type/catalogue No.		

	20% spare terminals furnished?		
13.	Ground bus Material Size mm		
14.	Painting Type of finish Colour shade Inside/Outside Details of painting procedure furnished?		
15.	Breaker control switch Make Type Reference standard Contact rating		
16.	Make & Continuous Amp Break (inductive) Amp		
17.	Meter selector switch Make Type Reference standard Contact rating Make and continuous Amp Break (inductive) Amp		
18.	Push button Make Type Reference standard Contact rating Make and continuous Amp Break (inductive) Amp 5. No. and type of contacts per button		
19.	Lamps Make Type Reference standard Rating Volt Watt Series resistance		
20.	Indicating instruments Make Type Reference standard Type of movement Accuracy class Scale in degrees VA burden Current coil Voltage coil Size Range		

	Rated input Overload capacity without loss in accuracy (%) Continuous Short time 12. Burden on CT/PT		
21.	Annunciator Make Type Referred standard No. of annunciator groups furnished? No. of windows per group Overall dimension of a group mm Details write-up on scheme furnished?		
22.	Illumination status indication for isolators Make Type Rating Volt Watt		
23.	Semaphore indicators Make Rating Volt Watt		
24.	Fuses Make Type Fuse bases provided with imprints of fuse rating and voltage	Yes/No	
25.	Relays Catalogue of all relays submitted with bid Whether tenderer agree to conduct all site tests as asked If 'NO' indicated deviations Whether quality assurance plan is acceptable If 'NO' indicate deviations Whether tenderer agree to provide No. of aux. Relays timers, range of relays/meters terminal blocks, control switches, wiring etc. as per approved drawings Minimum clearance between relays/meter/casings Horizontal Vertical Deviation if any on technical design parameters for control protection metering and alarm system Any additional protection, metering control; features, if necessary/desirable from tenderer's point of view	Yes/No Yes/No	

GUARANTEED TECHNICAL PARTICULARS**EARTHING & LIGHTNING PROTECTION**

Sl.	Particulars	As specified	As offered
1.	Size of earth strip for the yard		
2.	Gap between earth mat conductors		
3.	Size of main outer strip		
4.	Galvanizing content on above		
5.	Value of earthing resistance (proposed to be achieved)		
6.	Standard to be following for galvanizing		
7.	Type of electrodes		
8.	Construction of earthing pit as per IS	Included	
9.	Deviation if any on technical data sheet		
10.	Cable identification tag		
11.	Material		
12.	Thickness		
13.	Binding wire material		
14.	Buried cable/markers/covers		
15.	Applicable standards		
16.	Material of protective covers 1.1 kV cables		
17.	LV Cables		
18.	Conduit & floor opening sealing compounds		
19.	Material & composition for : i. Water proofing ii. Fire proofing		
20.	Grounding for cable amount/sheaths i. Material of conductor ii. Size		
21.	Structural steel i. Painting of fabricated steel a. Type of paint and no. of coats of primer b. Type of paint no. of coats and colour of furnish paint		
22.	Whether shield wires or lighting conductors have been envisaged for the lightning protection		
23.	Angle for protection		
24.	Numbers of electrodes provided		
25.	Earthing resistance value		
26.	Size of down conductors		
27.	Standard followed		
28.	Deviations if any on technical data sheet		
29.	Tools provided necessary tools, tackles, crimping tools etc. ii. Welding equipment iii. HV cable testing equipment	Yes/No Yes/No Yes/No	

**GUARANTEED TECHNICAL PARTICULARS
POWER HOUSE LIGHTING**

Sl. No.	Particulars	As specified	As Offered
1	Illumination levels of machine hall	Normal	
2	No. and type of fixtures		
3	Illumination levels of Switchgear room		
4	No. and type of fixtures		
5	Illumination levels of Control room		
6	No. and type of fixtures		
7	Illumination levels of Office room		
8	No. and type of fixtures		
9	Illumination levels of Turbine floor		
10	No. and type of fixtures		
11	Illumination levels of Switchyard		
12	No. and type of fixtures		
13	Illumination levels of Compressor room/ pump house etc.		
14	No. and type of fixtures		
15	Illumination levels of Turbine auxiliaries		
16	No. and type of fixtures		
17	Illumination levels of Cable basement		
18	No. and type of fixtures		
19	Street lighting		
20	No. of posts		
21	Height		
22	No. of Masts		

23	Height		
24	Make of conduit pipes, type, size and thickness		
25	Make of Sockets		
26	No. of sockets (20A)		
27	No. of sockets (63A)		
28	No. of sockets (5A)		
29	No. of sockets (15A)		
30	Method of automatic control (synchronous timer or photocell)		
31	Sub distribution boards		
32	Size of boards		
33	No. of circuits in one board		
34	Rating of MCCBs		
35	Short time rating		
36	No. of operations at breaking at 100% short circuit current		
37	Location of sub distribution boards		
38	Environmental protection		
39	Thickness of sheet		
40	Make of fixtures/fittings		
41	Wattage		
42	Size of wires		
43	Current carrying capacity		
44	Fusing current and time		