GENERAL TECHNICAL SPECIFICATION

July 2026

Engineering Department

WEST BENGAL STATE ELECTRICITY TRANSMISSION COMPANY LIMITED
পশ্চিমবঙ্গ রাজ্য বিদ্যুৎ সংবহন কোম্পানি লিমিটেড
(পশ্চিমবঙ্গ সরকারের একটি উদ্যোগ)

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Updates for WBSETCL / TECH SPEC / Rev.-2.1

TECHNICAL PARTICULARS OF THE SYSTEM: -

In **Sl no. 6** System fault level (KA) for Other Outdoor equipment changed from 25 to 31.5 for 3 sec. in 33 KV system.

GENERAL TECHNICAL SPECIFICATION

The scope of specification is inclusive of but not limited to following items:

1) Preparation of land utilisation plan, single line diagram, structural layout, sectional drawings of structural layout etc for new substation.

2) Preparation of GIS single line diagram, Gas barrier arrangement drawing, GIS equipment layout drawing in GIS Hall/PEB, Duct layout wherever applicable etc for new/extension GIS substation.

3) For future extension of GIS bus bar rating and details, conductor profile and fitment details shall have to be furnished during detailed engineering.

4) For existing substation the purchaser will supply indicative land utilisation plan, single line diagram, structural layout, sectional drawings of substation along with Tender document. Other related drawings if required shall also be supplied to successful bidders.

5) Design and Engineering, testing at manufacturer's works, supply and delivery at site of all equipment under the scope of supply of successful bidder and as indicated in the schedule of work for Electrical Equipment of Sub-Station and erection, testing at site & commissioning of the same.

6) Fabrication, galvanizing, testing, supply and delivery of Sub-Station structures including erection and commissioning at sub-station.

7) Design, Engineering and construction of foundation of Sub-Station structure to be supplied by contractor for substation

8) Fabrication, galvanizing, testing, supply and delivery of structure for all equipments, under the scope of supply of successful bidder of different voltage classes & as indicated in respective schedule contractor for substation.

   Design, Engineering and construction of foundation of equipment structure for all equipments, under the scope of supply of successful bidder of different voltage classes and as indicated in respective schedule.

9) Design, Engineering and construction of Control Room building, store shed with office. Dormitory & 'C' type Quarter for family, open shed for D.G set, Pump House.

10) Design, Engineering and construction of Pre Engineered Building (PEB) and EOT crane new/extension GIS substation.

11) Supply and delivery of power cable, control cables, 33KV and 132KV XLPE Cables of required sizes and quantity including laying at underground and termination of the said cables at respective ends for successful commissioning.

12) Supply, delivery and erection of clamps and connectors and hardware fittings required for commissioning of bays and termination of line as per approved drawings including erection and commissioning.

13) Design, erection and commissioning of sub-station earthing system including laying of earth mat as per approved design and layout, lightning protection of switch yard using Lighting Mast Structure and commissioning of the same. However, total earthing system for the entire switchyard in respect of equipment/structure connection below and above ground are within the scope of the contract including total earthing system of control room building etc. as detailed in technical specification.

14) Design, supply and delivery, erection and commissioning of fire protection and fire fighting system including emulsifier system, water hydrant system and others works as per technical specification and Air Conditioning system.

15) Design, engineering, erection and commissioning of equipment for tele-protection of EHV lines, speech communication with dialing and transmission of data, telemetering through PLCC and Microwave. The mode of telecommunication may be by Power Line Carrier Communication (PLCC) or OPGW communication as per schedule of Works

16) Supply and delivery of spares as per relevant schedule.

17) Supply, delivery, erection, testing & commissioning of Control & Relay Panel.

18) Design, supply and commissioning of AC & DC Switch Board, battery and battery charger, AC auxiliary system etc.

19) Design, supply and commissioning of SCADA, RTU, SAS, BCU etc as mentioned in BOQ.

20) Design, supply and commissioning of E HOUSE etc as mentioned in BOQ.

21) Construction of operating Platform with stair & handrail in front of Breaker cubicles and other equipment (where necessary) is to be done for easy access and maintenance.

22) Power Transformers shall be supplied by WBSETCL at site. Erection, Commissioning and testing shall be under the scope of contractor and that shall be guided by relevant schedule. If required, power transformers and accessories may have to be dragged and placed on the plinth / rail from the existing location. No extra price implication will be there in case the plinth and approach road / site was not ready as per approved L2 network during unloading of the transformer at site.

23) Dissolved Gas Analysis (DGA): After filtration & before commissioning of the Transformer at site, DGA test will have to be carried by the Turn Key Contractor in presence of Transformer manufacturer and customer's representative without commercial impact and the report will be handed over to respective O&M wing as future reference.

24) Design, Supply, delivery, erection and Commissioning of illumination system complete for indoor lighting like control room building, Store Shed with office, Open Shed for DG Set, Pump House & other buildings and outdoor lighting like Switchyard, road etc. and at colony quarters/dormitory, guest house etc. with wiring and provision of AC supply as per requirement to be constructed under the scope of this technical specification. However item of work to be executed i.r.o substation would be as per schedule of work.

25) **Any other work not specified in detailed in the above item but felt necessary for successful commissioning for trouble free operation of the substation equipments as per approved scheme are within the scope of the work. Any technical requirement**

found necessary even after approval or for any change of philosophy, the modification of scheme has to be carried out by the bidder without any extra cost.

TENDER DRAWINGS:

The followings are the Tender Drawings enclosed for reference.

a) Indicative drawing for control room and control room building, Dormitory & C-type Quarter.
b) Indicative drawings for Store shed with office, Open Shed for D.G. set etc.
c) Indicative single line layout drawing/structural layout.
d) Auxiliary power supply scheme if applicable.

However, the work shall have to be executed as per the scope of work specified in the bid document and as per the design and drawing approved by WBSETCL.

The bidder may design his own layout for new sub-stations following the regulations of clearance of different voltage class as per in line with IS/CBIP/Technical Specification requirement and Indian Electricity (IE) rules.

STANDARD:

All materials and equipment shall generally comply in all respect with the latest edition with all amendments (as on the date of bid submission) of relevant Indian Standards (IS) & IEC if not specified otherwise.

The equipments are also to comply with latest and revised Indian Electricity Act and Electricity Rules and any other electrical statutory provisional Rules & Regulations and specific technical particulars and specification of related equipment/materials stated in different chapters.

Relevant Indian Standards have been specified in the specification of each equipment. The contractor shall also note that list of standards presented in this specification is not complete. Whenever necessary the list of standards shall be considered in conjunction with specific IS and IEC.

The bidder shall clearly indicate in his bid the specific Indian Standards with which the works will be carried out.

All the activities to be done to comply stipulations / provisions of CEA (Measures Relating to Safety & Electric Supply) Regulation 2010 and other Government norms & regulations.

SITE DATA:

The equipments supplied shall be suitable for heavily polluted atmosphere and shall be suitable for continuous operation at their rated full load capacity under following climatic condition.

i)	Maximum Ambient Temperature	50^0C
ii)	Minimum Ambient Temperature	4^0C
iii)	Maximum Yearly Average Ambient Temperature	32^0C

iv)	Maximum relative humidity	100%
v)	Minimum relative humidity	50%
vi)	Average rainfall per annum	2000 mm
vii)	Average no. of thunder storm days per annum,	75
viii)	Maximum height above sea level	1000 mtr.
ix)	Maximum wind speed	50 m/sec.
x)	Basic horizontal seismic co-efficient	0.04

TECHNICAL PARTICULARS OF THE SYSTEM:

1.	Nominal system voltage (KV)	400	220	132	33
2.	Highest system voltage (KV)	420	245	145	36
3.	System Neutral earthing	Effectively Earthed			Earthed through grounding transformer for 220/132/33KV & 132/33KV SubStn.
4(a)	Basic insulation level (KVP)(1.2/50 micro Sec.)				
	i) Equipments other than Transformers	1425	1050	650	170
	ii) All Transformers	1300	950	550	170
4(b)	i) Switching Impulse withstand voltage (250/2500 micro sec.) dry & wet (KVP)	1050	-	-	-
5.	One minute power frequency dry & wet withstand voltage (KV RMS)				
	i) equipments other than transformers and reactors	630	460	275	70
	ii) all transformers and reactors	570	395	230	70
6.	System fault level (KA)	50 for 1 sec.	40 for 3 sec.	31.5 for 3 sec.	i) Indoor Switchgear – 31.5 for 3 sec. ii) Other Outdoor equipment – 31.5 for 3 sec. [R2.1]
7.	Minimum creepage distance for insulators (total mm)	10500	6125	3625	900
8.	Minimum clearance in air (mm)				
	i) Phase to phase	4100	2,400	1,600	400
	ii) Phase to earth	3400	2,100	1,380	320
	iii) Sectional clearance (mm)	6500	5000	4000	3000

9.	Minimum distance of the lowest earth part of insulating supporting life conductors from ground (mm)	2440			
10.	Max radio interference voltage for frequency between 0.5 MHZ and 2MHZ at 320 KV rms for 400KV System and 156KV rms for 220KV system & 92KV rms for 132KV sys.	1000 micro-volts	1000 microvolts	500 microvolts	-
11.	Bus configuration	2 main 1 transfer	2 main 1 transfer	1 main 1 transfer, if not specified categorically	1 main 1 transfer
		Main Buses with Quadruple Moose and Transfer bus with double moose	Main bus with double moose		
12.	Frequency	50HZ	50HZ	50 HZ	50 HZ
13.	Phase to phase distance (mm) of sub-station				
	i) Along the bay	7000	4500	2700	1500
	ii) Strung bus	7000	4500	2700	1670
14.	Height of bays (mm) of sub-stn.				
	i) Along the bay (C/L of Pipe Bus) from plinth	8000	6000	5350	3650
	ii) Strung bus (from plinth)	15000	10700	8560	5564
15	No. of Phases	3	3	3	3
16	Corona Extinction Voltage (KV)	320	156	105	-
17	Jack Bus Height from Ground level	22800	16450	14000	7510

The current density of Aluminum / copper shall be considered as 0.75 / 1.75 A per sq. mm for design of equipments.

MAKERS' LIST OF EQUIPMENT AND MATERIALS :

The detailed approved Makers' is published in Company Website – www.wbsetcl.in under SubCategory 'Tenders And Bids'. The contractor shall strictly follow that while submitting equipment drawings for approval.

DRAWINGS TO BE FURNISHED BY THE CONTRACTOR AFTER AWARD OF CONTRACT:

1. **L2 Networks to submitted to Project Departments** involving detailed programmed on key dates regarding supply of all equipment as well as sequential submission of all drawings of sub-stations design as well as equipment drawing as per relevant clause of GCC from the date of receipt of WBSETCL's Letter of Award.

2. On obtaining approval of the above mentioned programmed L2 Networks by WBSETCL, contractor has to submit all relevant drawings as per above approved schedule in sequential manner to **Engineering Departments** which are tabulated below as a indicative broad guide lines but not exhaustive.

    a) Land Utilization Plan Drawings with composite plan showing switch yard, control room, Township, Quarters
    b) Electrical Layout Drawings of Switch Yard with Key-plan of switch yards with elevation
    c) Layout Drawings of Civil Infrastructures inclusive of all buildings, roads, go-down etc. with elevation
    d) Structural Layout Drawings of Switch Yards
    e) Foundation Drawings of Switch Yard Equipments , cable trenches, Structures, Civil Infrastructures outside switchyard
    f) GIS single line diagram, Gas barrier arrangement drawing, GIS equipment layout drawing in GIS Hall/PEB, Duct layout wherever applicable for new GIS substation
    g) Earth mat layout Drawings with earth mat design calculation
    h) DSLP Layout Drawings with lightning Protection design calculation of switch yard & control room.
    i) All Equipments Drawings & Specifications with Guaranteed Technical particulars
    j) Control & Protection schemes Drawings
    k) SCADA, RTU, SAS, BCU drawings if applicable as per BOQ
    l) E HOUSE drawing as per BOQ.
    m) Drawings & Specifications of Relays & Instruments
    n) Conductors, Clamps & Connectors, Fitting & Fixtures Drawings and specifications
    o) Telecommunication scheme drawings
    p) Telecommunication Equipments Drawings & Specifications with Guaranteed Technical particulars
    q) Fire Protection scheme drawings, layout plan, specifications of Equipments, Design calculation of water pressure.
    r) Control Room & switch yard illumination schemes with Design calculation
    s) Air Conditioning schemes with Design calculation
    t) Fire Fighting system schemes with design calculation & drawings
    u) Substation DC schemes, DC Distribution, Panel Drawings with Battery & Charger Panel Drawings
    v) Auxiliary AC schemes, Panel Drawings with designed data
    w) Commissioning Plan

3. The contractor may be asked to submit any other drawing necessary for successful works and that will be obligatory in the part of the contractor.

4. Relevant Type Test Reports specifically in case of new design of equipment may be asked to submit at the part of drawing approval process that will be obligatory in the part of the contractor.

5. Approval shall have to be taken in sequential manner for correct proceedings of work with proper time managements.

6. Design calculations as and where necessary or mentioned in the technical specification shall also to be submitted. As per agreed schedule of contract agreement, the contractor shall start submission of drawings and calculations for scrutiny and approval of the WBSETCL. 6(six) copies of drawings and calculations as per stipulation of GCC shall be submitted. Any modification suggested by WBSETCL shall be incorporated in the drawings and design calculation and re-submitted for approval. The drawing shall be clear and legible in all respects. WBSETCL shall have the rights to make any change in the design and drawings, which may be necessary in the opinion of WBSETCL to make the equipment conform to the provision and intent of the specification without additional cost to WBSETCL.

7. Approval conveyed by WBSETCL does not relieve vendor / contractor of his contractual obligations. Vendor / contractor is responsible for correctness of dimensions, materials of construction, weight, quantities, equipment ratings, design details, assembly / construction quality & workmanship, operation & maintenance performance requirements. WBSETCL technical specification, Indian Statutory laws & other Regulations (IS/CBIP/Tech. Specification norms and Indian Electricity Rules) as may be applicable shall also be taken care of with the consideration of purchaser / consumer's rights under the contract.

8. Approval by the WBSETCL of the contractor's drawings shall not relieve the contractor from his responsibility of accuracy there of or modification required during actual execution or for any deviation in scheme from technical specification with accepted deviations if there be any. WBSETCL reserves the right to call at his discretion the design personnel of the manufacturer of equipment/material and all other design related works for the purpose of discussion whenever necessary and submission of details of technical data for the purpose of checking the adequacy of contractor's design. Any manufacturing work performed prior to approval of drawing will be at contractor's risk.

9. In parallel to the submission of drawings & Design Calculation, the contractor shall submit the equipments drawings for approval. **After approval the contractor shall submit both hard and soft copy of drawings for record/distribution purpose.**

10. After approval the contractor shall place the inspection call to the Engineering Department at least 15 (fifteen) days before the date of inspection along with relevant Factory Routine test certificates.

Workmanship

1. The design and workmanship shall be in accordance with the best engineering practices to ensure satisfactory performance throughout the service life. Materials and components not specifically stated in this specification but which are necessary for satisfactory operation of the equipment and schemes are deemed to be included in the scope of specification unless specifically excluded. Similar parts of any equipment shall be interchangeable.

2. Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/or needed for erection, completion and safe operation of the equipment as required by applicable

standards though they may not have been specifically detailed in the Technical Specification unless included in the list of exclusion.

3. All equipment shall be supplied with terminal connectors as per technical specification of clamps and connectors and two earthing points placed preferably in diagonally opposite position for connection to earth mat by M.S./GS flat of suitable size. The bid shall be in conformity with the specification. All deviations from the specification shall be clearly brought out in the schedule of deviation. Any discrepancy between the specification and proposal of bid, if not clearly brought out in the deviation schedule, will not be considered as valid deviation.