

# **TENDER SPECIFICATION BHEL PSSR SCT 2070**

**FOR**

**Package 1:** Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-1 (Main Plant & Identified BOP area)

**Package-2:** Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-2

**of**

**2 x 660MW Ennore SEZ Super Critical Thermal Power Project  
at Ash Dyke of NCTPS, Tamil Nadu.**

**PRICE BID**

**VOLUME –II**



**BHARAT HEAVY ELECTRICALS LIMITED**

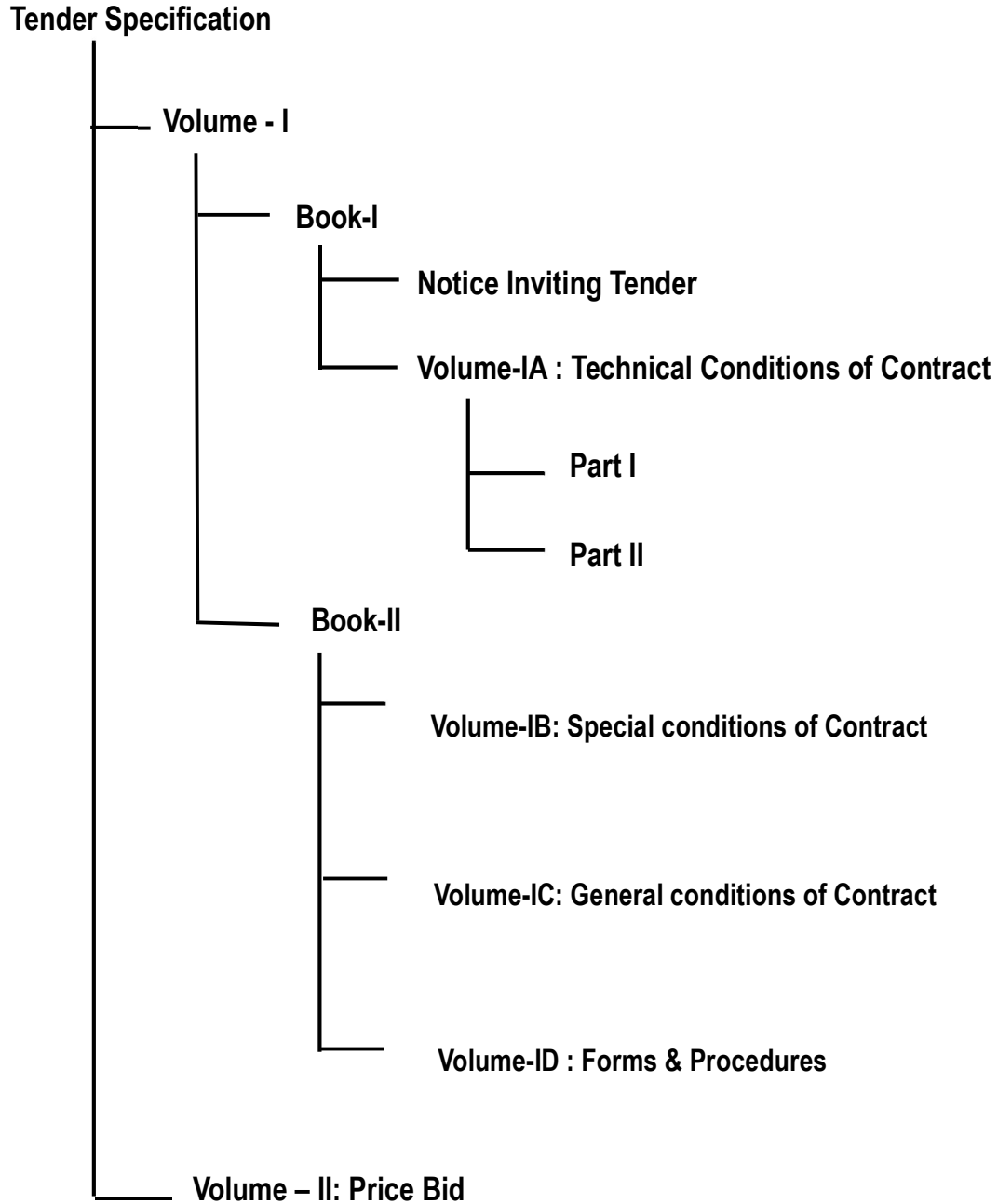
(A Government of India Undertaking)

Power Sector – Southern Region

BHEL Integrated Complex, TNEB Road

Pallikaranai, Chennai-600100

**TENDER SPECIFICATION CONSISTS OF**



## PRICE BID

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## PRICE BID

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### **PART A**

#### **Instruction to Bidders:**

1. The quantity indicated in the BOQ / Price bid (Part C) is approximate only and is liable for variation. Payment will be as per actual quantity executed as certified by BHEL Engineer.
2. Tenderers are requested to affix their company seal and authorized signature in all pages.
3. Bidders shall quote 'Total Amount' in the format enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender and upload the same under 'Packet details - > Tender covers -> Finance '(Cover Type Description – Price Bid)'' and same shall be taken into account for evaluation and awarding and hence, shall be complete in all respect for the full scope of work defined in specification and in accordance with terms & conditions of the tender. Any other entry elsewhere in the price bid shall be treated as Null and Void. Quoting of rates in any other form/ formats will not be entertained.
4. The above mentioned 'Total amount' is for the entire Bill of Quantity (BOQ) given in Part -C of the Price Bid.
5. BHEL has pre-fixed the weightages for the amount of individual items of Bill of Quantity with respect to the 'Total Amount' in Part-C.
6. Based on the pre-fixed weightages, the amount for the individual items of the Bill of Quantity shall be arrived at. This amount shall be rounded off to the nearest rupee.
7. Based on the quantities of individual item and the amount arrived in SI No: 6 above, unit rate of individual items shall be derived. This unit rate shall be rounded off to four decimal places.
8. Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per SI No.7 above.

**Part B: Format to quote Total Amount**

**Tender Specification BHEL:PSSR:SCT:2070 for Package 1: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-1 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu., Package-2: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-2 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu. at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

**QUOTED**

**Total Amount for the entire Bill of Quantities(BOQ) given in Part C**

**NOT QUOTED**

**Note :**

Bidders to quote Total Amount in this format given above, which shall be taken into account for evaluation and awarding and hence, shall be complete in all respect for the full scope defined in specification and in accordance with all terms & conditions of tender.

**Date**

**SIGNATURE OF BIDDER WITH SEAL**

**Part C : Bill of Quantities**

**Tender Specification BHEL:PSSR:SCT:2070 for Package 1: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-1 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu.**

**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
I	ERECTION AND COMMISSIONING OF TRANSFORMERS	--		
A.1.1	Generator Transformer (GT#1) 275/220/165 MVA,(420/Sq.root(3))/21 kV, 1 phase, ONAN/ONAF/OFAF cooled,YNd11	SET	4	.0670551
B.1.1	Start Up Transformer (SUT) 100/60/60 MVA,400/11.5-11.5 kV 3 phase ONAN/ONAF cooled,YNyn0yn0	SET	1	.0135078
B.1.2	Station Transformer (ST 1) 80/40/40 MVA,21/11.5-11.5 kV 3 phase ONAN/ONAFcooled,Dyn1yn1	SET	1	.0069436
B.1.3	Unit Transformer (1) 40/50 MVA 21/11.5 kV,3 phaseONAN/ONAF cooled, Dyn1	SET	2	.0224355
B.2.1, B.2.2	Sea Water Intake & ECHS Transformers: Step Up: 20 MVA, 11/36 kV, 3 phase, ONAN/ONAF/Dyn11 Step Down:20 MVA, 33/11.5 kV, 3 phase, ONAN/ONAF/Dyn11	SET	4	.0266365
B.2.3, B.2.4	Unit Auxiliary & ICHP Transformers: 16 MVA, 11/3.6 kV, 3 phase, ONAN/Dyn11	SET	4	.0262861
D.10.1	Station Auxiliary Transformers: 8 MVA, 11/3.6kV, 3 phase, ONAN/Dyn11	SET	2	.0062934
B.2.5	Sea Water Intake Auxiliary Transformers: 6.3 MVA, 11/3.6kV, 3 phase, ONAN/Dyn11	SET	2	.0092208
D.10.2 , D.10.3 ,	External CHP/RODM Auxiliary Transformers: 6.3 MVA, 11/3.6kV, 3 phase, ONAN/Dyn11	SET	4	.0129835
D.10.4	AHP Auxiliary Transformer: 3.5 MVA, 11/3.6kV, 3 phase, ONAN/Dyn11	SET	2	.0031696

**Part C : Bill of Quantities**

**Tender Specification BHEL:PSSR:SCT:2070 for Package 1: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-1 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu.**

**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
B.2.6, B.2.7	2.5 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 10200 kg approx each.	SET	4	.0120812
B.2.8, B.2.9, B.2.10	2 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 8000 kg approx each.	SET	6	.0142131
B.2.11 , B.2.12	1.6 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 7000 kg approx each.	SET	10	.0207275
B.2.13	1.25 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 6600 kg approx each.	SET	2	.0039086
B.2.14 , B.2.15	1 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 4000 kg approx each.	SET	4	.0047377
B.2.16	0.63 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 3600 kg approx each.	SET	2	.002132
II	ERECTION AND COMMISSIONING OF HT BUSDUCT	--		
II-A	IPBD	--		
C.1.1	27 kV IP Busduct (Maximum Voltage - 36kV) along with support structures	SET	1	.0534201
II-B	SPBD	--		
II-B- (i)	11 kV-3500/3150/2500 A SPBD BUSDUCT, includes seal off bushing, rubber bellows, support steel structure, space heaters, grounding.	--		

**Part C : Bill of Quantities**

**Tender Specification BHEL:PSSR:SCT:2070 for Package 1: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-1 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu.**

**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
C.2.1.1, C.2.1.2, C.2.1.3, C.2.1.4, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, C.2.3.1, C.2.3.2	11 kV-3500/3150/2500 Amp	Mtrs	590	.0277157
II-B-(ii)	3.3 kV-3150/1600/1250/1000 A SPBD BUSDUCT includes Seal-off Bushing, Rubber Bellows, Aluminium Splice Plate & Flexibles, Copper Flexibles, Support Steel Structure, Space Heater arrangemnt, Grounding.	--		

**Part C : Bill of Quantities**

**Tender Specification BHEL:PSSR:SCT:2070 for Package 1: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-1 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu. at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
C.2.4.1, C.2.4.2, C.2.5, C.2.6, C.2.7, C.2.8, C.2.9, C.2.10	3.3 kV-3150/1600/1250/1000 Amp	Mtrs	340	.0151112
III	ERECTION AND COMMISSIONING OF HT SWITCHGEAR	--		
III-A	33 kV Switchgear	--		
A.2.1	SW intake & ECHS Switchboard 0AA - 33KV, Over all panel sizes- 14300 (L) x 3248 (D) x2600(H) Weight of shipping for 1 panel - 1300 Kg(1300mm wide) aprox. for shipping two panel - 2600 Kg aprox.(1300mm + 130mm wide)	SET	1	.0035789
III-B	11 kV Switchgear	--		
A.3.1, A.3.2,	Unit Switchboard 1BA/1BB - 11KV, 3150 A, 21 panels, 11 shipping sections . Over all panel sizes- 17000 (L) x 2873(D)X2805 (H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox. for shipping two panel - 2500 Kg aprox.(820mm + 820mm wide)	SET	2	.0070747
A.3.3, A.3.4,	Station Switchboard 0BA/0BB - 11KV, 2500 A,17 panels, 9 shipping sections . Over all panel sizes- 13720 (L) x 2927 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	2	.0057623

**Part C : Bill of Quantities**

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A.3.5	Start Up Switchboard 0BE - 11KV, 3500 A,12 panels, 7 shipping sections . Over all panel sizes- 10020 (L) x 2927 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0020854
A.3.6	SW & ECHS Switchboard 0BG - 11KV, 1250 A, 18 panels, 11 shipping sections . Over all panel sizes- 14540 (L) x 2349 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0029952
III-C	3.3 kV Switchgear	--		
A.4.1	Unit Auxiliary Switchboard 1CA - 3.3 KV, 3150 A, 28 panels of 15 shipping sections . Over all panel sizes- 22960 (L) x 2873 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0047666
A.4.2	Station Auxiliary Switchboard 0CA - 3.3 KV, 1600 A, 27 panels, 15 shipping sections . Over all panel sizes- 21920 (L) x 2873 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0045648
A.4.3	CHP Auxiliary Switchboard 0CB - 3.3 KV, 3150 A, 33 panels,18 shipping sections . Over all panel sizes- 26840 (L) x 2927 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0055855
A.4.4	AHP Auxiliary Switchboard 0CC - 3.3 KV,1000 A, 20 panels, 11 shipping sections . Over all panel sizes- 16180 (L) x 2873 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0033671

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A.4.5	RODM Auxiliary Switchboard OCD - 3.3 KV, 1250 A, 26 panels, 14 shipping sections . Over all panel sizes- 21100 (L) x 2873 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.004394
A.4.6, A.4.7	CHP Bunker/Ext.CHP Auxiliary Switchboard OCE - 3.3 KV, 630 A, 23 panels,13 shipping sections . Over all panel sizes- 17820 (L) x 2349 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	2	.0074168
A.4.8	Sea Water intake Switchboard OCH - 3.3 KV,1000 A,14 panels, 09 shipping sections . Over all panel sizes- 11260 (L) x 2873 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0023393
IV	ERECTION AND COMMISSIONING OF CONTROL PANEL SYSTEM	--		
A.5.1	Fast Bus Transfer System Panels for 11 KV SWGR size 800 (w) x 800 (d) x 2295 (h) weight 300 kg aprox, along with accessories computers, printers,table, checking of pre assembled LIUs, communication cables etc. (1BA to 0BE & 1BB to 0BE)	SET	2	.0011183
A.5.2, A.5.3	Protection panel for Generator/GT/UT/ST/SUT with associated loose supplied items such as Laptop, PC, Printer, UPS, interconnecting cables, RJ45 cables etc. No. of Panels: 1 Nos supplied in suitable 1 No. of shipping sections. Size of the Panel: 2230 (H) x 1000 (W) x 1000 (D) mm Approximate weight of panel : 450 kg.	SET	5	.0074629

**Part C : Bill of Quantities**

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A.5.4, A.5.5, A.5.6, A.5.7, A.5.8, A.5.9, A.5.10	Data concentrator panels along with loose items size 800mm(W) x800mm(D) x 2000mm(H) aprox weight 200kg along with Loose items of Data concentrator system - HMI OWS computer with monitor - 3 nos, console table 75 KG (1000mm x 750mm x 574 mm) - 1 no, A4 color printer - 1 no, UPS 1 KVA - 1 no, Ethernet switch - 12 nos, LIU - 10 nos, Laptop computer - 1 nos, Patch cards & RJ45 conecters reqd qty, GPS antanna alongwith cable, GPS receiver, GPS clock etc. Assembling of loose supply computer table, printer table, chairs etc	SET	6	.0047532
A.5.11 , A.5.12 , A.5.13 , A.5.14 , A.5.15	Earthing Trucks (feeders and busbars) 33kV/11 kV/ 3.3 kV	SET	26	.0020636
D.7.8	11 kV Neutral Ground Resistor (NGR) with NGR Cubicle of size 1200x1350x950 of weight app. 495 kg and with Supporting Structures	SET	6	.0033419
D.7.9	3.3 kV Neutral Ground Resistor (NGR) with NGR Cubicle of size 1000x900x800 of weight app. 290 kg and with Supporting Structures.	SET	7	.0038989
D.8.1	Generator circuit breaker (GCB) below generator Rating 23595 A, 21 kV size app. 7000mm x 4000 mm x 4000 mm along with centralizing cubicle and overall weight - 10067 kg.	SET	1	.0032032
E.6	Unit Control Panel(UCP)- approx panel size 2216(L) x1000(W) x 2355(H) approx weight 900 kg	No.	1	.000557

**Part C : Bill of Quantities**

**Tender Specification BHEL:PSSR:SCT:2070 for Package 1: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-1 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu.**

**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
E.7	Unit Electrical Control Panel(UECP)- approx panel size 2792 (L)x 1000(W) x 2355(H) , approx weight 900 kg	No.	1	.000557
E.8, E.9, E.10, E.11	EDMS/IEMS (CYJ-01 & CYJ-02) electrical interface system panel size 750(L) x750(W) x 2067(H) approx weight 400 kg each along with HMI items i.e Server,OWS,EOWS,Printer,Cable ,etc.	SET	2	.0013148
E.1	Digital AVR consisting of 2No. Regulation cubicle, 1 No. Thyristor cubicle & 1 No. Field suppression cubicle, and associated loose supplied items including laying & termination of loose supplied power & control cables for DAVR system.DAVR Overall dimension: 4053 (L)x 800 (Wx 2415(H) mm Approximate wt. : 3000 Kg. * Lump sum rate to be quoted.	SET	1	.0017688
V	LAYING OF HT CABLES 11KV (UE) ARMoured; ALUMINIUM CONDUCTOR ,XLPE INSULATED PVC/FRLS OUTER SHEATHED CABLE.	--		
D.1.1	1C x 630 sqmm (AL)	Mtrs	12,500	.0143127
D.1.2	1C x 300 sqmm (AL)	Mtrs	34,250	.0237365
D.1.3	3C x 185 sqmm (AL)	Mtrs	18,000	.0214238
VI	LAYING OF HT CABLES 3.3KV (UE) ARMoured; ALUMINIUM CONDUCTOR ,XLPE INSULATED PVC/FRLS OUTER SHEATHED CABLE.	--		
D.2.1	1C x 120 sqmm (AL)	Mtrs	9,000	.0067797
D.2.2	3C x 120 sqmm (AL)	Mtrs	10,250	.0120453
VII	Installation of Cable termination and joint kits for 11/11 KV (UE) GRADE, XLPE Insulated aluminium conductor armoured cables for the following sizes.	--		

**Part C : Bill of Quantities**

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.3.1, D.4.1	Termination/Joint kit for 1C x 630 sqmm (AL)	Nos.	57	.0037442
D.3.2, D.4.2	Termination/Joint kit for 1C x 300 sqmm (AL)	Nos.	184	.0073462
D.3.3, D.4.3	Termination/Joint kit for 3C x 185 sqmm (AL)	Nos.	78	.0054633
VIII	Installation of Cable termination kits and joint kit for 3.3 KV (UE) GRADE, XLPE Insulated aluminium conductor armoured cables for the following sizes.	--		
D.5.1, D.6.1	Termination KIT/Joint KIT 3.3 KV 1C-240 sqmm AL ARM (indoor) AL LUG	Nos.	87	.0053242
D.5.2, D.6.2	Termination KIT/Joint KIT 3.3 KV 3C-185 sqmm AL ARM (indoor) AL LUG	Nos.	63	.0042095
IX	INSTALLATION OF HOT DIP GALVANIZED STEEL FLATS	--		
D.7.1	GS FLAT 65 X 8 mm	Mtrs	4,200	.0074667
D.7.2	GS FLAT 50 X 6 mm	Mtrs	5,100	.0059933
D.7.3	GS FLAT 25 X 6 mm	Mtrs	875	.0009228
D.7.4	GS FLAT 25 X 3 mm	Mtrs	450	.0004746
D.7.5	GS WIRE 8 SWG	Mtrs	1,700	.0001281
X	FABRICATION & ERECTION OF STRUCTURAL STEEL	--		

**Part C : Bill of Quantities**

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.11.1 , D.11.2 , D.11.3 , D.11.4	Structural Steel (ISMC, ISMB, ISA, etc)	MT	47	.0124902
XI	COMMISSIONING OF THE FOLLOWING ERECTED BY MECHANICAL CONTRACTOR	--		
D.9.1	Generator 660 MW - H.V. testing, meggering of Bushings & Accessories, resistance measurement, meggering including dry out of Generator and as per field quality plan.	SET	1	.0027265
D.9.2	Exciter dryer / heater	No.	1	.0000516
D.9.3	Generator Air Drier	No.	1	.0000516
D.9.4	CO2 Vaporizer	No.	1	.0000436
D.9.5	Exciter Stroboscope	No.	1	.0000436
D.9.6	11 KV HT drives	Nos.	10	.0018162
D.9.7, D.9.8	3.3 KV HT Drives	Nos.	51	.0048315
XII	LAYING OF LT POWER / CONTROL CABLES 1.1KV, XLPE INSULATED, GALVANISED STEEL ARMoured SINGLE/MULTICORE CABLES FRLS PVC. (AL/CU CABLES)	--		
E.2	3C x 50 sqmm copper (Excitation + power input)	Mtrs	800	.000217

**Part C : Bill of Quantities**

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
E.4	1Cx 70 sqmm copper (earthing)	Mtrs	100	.0000271
XIII	END TERMINATION OF LT POWER / CONTROL CABLES -1.1KV PVC/FRLS ARMoured AL/CU CONDUCTOR PVC INSULATED, FRLS OUTER SHEATHED.	--		
E.3	3C x 50 sqmm copper (Excitation + power input)	Nos.	16	.0000704
E.5	1Cx 70 sqmm copper (earthing)	Nos.	4	.0000039
XIV	LAYING AND TERMINATION OF INSTRUMENTATION CABLES	--		
A.5.16	OFC cable includes fixing of fibre optic components and termination kits LIU, face plates,cabinets,SC coupler,grounding etc	Mtrs	20,000	.0069304
A.5.17	OFC Cable splicing	Nos.	75	.000139
A.5.18	D link 4 pair PVC, CAT 5 Lan cable	Mtrs	6,000	.0006328
XV	ERECTION OF MISCELLANEOUS ITEMS	--		
D.7.6, F.1	Flexible braided copper conductor with copper clamp for gate earthing & Earthing with MS earth rod 40 mm (Below ground earthing system)	Nos.	158	.0001809
D.7.7	Treated Earth pit of Galvanized MS pipe of 40 mm Dia, 3000 m long with funnel and accessories including all civil works, filling of earth pit with alternate layer of chrcoal & salt as per IE specification and making of brick chamber, with both side plastering, supply and fising of manhole CI cover plate/RCC Slab etc. complete as per IS 3043 (only 40 mm GI pipe shall be supplied by BHEL)	SET	64	.008085

**Part C : Bill of Quantities**

**Tender Specification BHEL:PSSR:SCT:2070 for Package-2: Erection, Testing & Commissioning including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting of HT Electrical works for Unit-2 of 2 x 660MW Ennore SEZ Super Critical Thermal Power Project at Ash Dyke of NCTPS, Tamil Nadu. at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
I	ERECTION AND COMMISSIONING OF TRANSFORMERS	--		
G.1.1	Generator Transformer (GT#2) 275/220/165 MVA,(420/Sq.root(3))/21 kV, 1 phase, ONAN/ONAF/OFAF cooled,YNd11	SET	3	.0594721
H.1.1	Station Transformer (ST# 2) 80/40/40 MVA,21/11.5-11.5 kV 3 phase ONAN/ONAFcooled,Dyn1yn1	SET	1	.0069436
H.1.2	Unit Transformer (UT#2) 40/50 MVA 21/11.5 kV,3 phaseONAN/ONAF cooled, Dyn1	SET	2	.0224355
H.2.1	Unit Auxiliary Transformers: 16 MVA, 11/3.6 kV, 3 phase, ONAN/Dyn11	SET	2	.013143
H.2.2	2.5 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 10200 kg approx each.	SET	2	.0060406
H.2.3	2 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 8000 kg approx each.	SET	2	.0047377
H.2.4, H.2.5	1.6 MVA Cast Resin Dry Type Station Service Transformer Weight of Shipment: 7000 kg approx each.	SET	10	.0207275
II	ERECTION AND COMMISSIONING OF HT BUSDUCT	--		
II-A	IPBD	--		
J.1.1	27 kV IP Busduct (Maximum Voltage - 36kV) along with support structures	SET	1	.0534201
II-B	SPBD	--		

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
II-B-(i)	11 kV-3500/3150/2500 A SPBD BUSDUCT, includes seal off bushing, rubber bellows, support steel structure, space heaters, grounding.	--		
J.2.1.1 , J.2.1.2 , J.2.1.3 , J.2.1.4 , J.2.2.1 , J.2.2.2 , J.2.2.3 , J.2.2.4	11 kV-3500/3150/2500 Amp	Mtrs	388	.0182266
II-B-(ii)	3.3 kV-3150 A SPBD BUSDUCT includes Seal-off Bushing, Rubber Bellows, Aluminium Splice Plate & Flexibles, Copper Flexibles, Support Steel Structure, Space Heater arrangemnt, Grounding.	--		
J.2.3.1 , J.2.3.2	3.3 kV-3150 Amp	Mtrs	125	.0055556
III	ERECTION AND COMMISSIONING OF HT SWITCHGEAR	--		
III-A	11 kV Switchgear	--		

**Part C : Bill of Quantities**

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.2.1, G.2.2	Unit Switchboard 2BA/2BB - 11KV, 3150 A, 21 panels, 11 shipping sections . Over all panel sizes- 17000 (L) x 2873(D)X2805 (H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox. for shipping two panel - 2500 Kg aprox.(820mm + 820mm wide)	SET	2	.0070747
G.2.3, G.2.4	Station Switchboard 0BC/0BD - 11KV, 2500 A,17 panels, 9 shipping sections . Over all panel sizes- 13720 (L) x 2927 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	2	.0057623
G.2.5	Start Up Switchboard 0BF - 11KV, 3500 A,12 panels, 7 shipping sections . Over all panel sizes- 10020 (L) x 2927 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0020854
III-B	3.3 kV Switchgear	--		
G.3.1	Unit Auxiliary Switchboard 2CA - 3.3 KV, 3150 A, 28 panels of 15 shipping sections . Over all panel sizes- 22960 (L) x 2873 (D) x2805(H) Weight of shipping for 1 panel - 1250 Kg(820mm wide) aprox.for shipping two panel - 2500 Kg aprox.(820 + 820mm wide)	SET	1	.0047666
IV	ERECTION AND COMMISSIONING OF CONTROL PANEL SYSTEM	--		
G.4.1	Fast Bus Transfer System Panels for 11 KV SWGR size 800 (w) x 800 (d) x 2295 (h) weight 300 kg aprox, along with accessories computers, printers,table, checking of pre assembled LIUs, communication cables etc. (2BA to 0BF & 2BB to 0BF)	SET	2	.0011183
G.4.2	Protection panel for Generator/GT/UT/ST with associated loose supplied items such as Laptop, PC, Printer, UPS, interconnecting cables, RJ45 cables etc. No. of Panels: 1 Nos supplied in suitable 1 No. of shipping sections. Size of the Panel: 2230 (H) x 1000 (W) x 1000 (D) mm Approximate weight of panel : 450 kg.	SET	4	.0059704

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.4.3, G.4.4	Data concentrator panels along with loose items size 800mm(W) x800mm(D) x 2000mm(H) aprox weight 200kg along with Loose items of Data concentrator system - HMI OWS computer with monitor - 3 nos, console table 75 KG (1000mm x 750mm x 574 mm) - 1 no, A4 color printer - 1 no, UPS 1 KVA - 1 no, Ethernet switch - 12 nos, LIU - 10 nos, Laptop computer - 1 nos, Patch cards & RJ45 conecters reqd qty, GPS antanna alongwith cable, GPS receiver, GPS clock etc. Assembling of loose supply computer table, printer table, chairs etc	SET	1	.0007922
G.4.5, G.4.6, G.4.7, G.4.8	Earthing Trucks (feeders and busbars) 11 kV/ 3.3 kV	SET	7	.0005556
K.7.8	11 kV Neutral Ground Resistor (NGR) with NGR Cubicle of size 1200x1350x950 of weight app. 495 kg and with Supporting Structures	SET	6	.0033419
K.7.9	3.3 kV Neutral Ground Resistor (NGR) with NGR Cubicle of size 1000x900x800 of weight app. 290 kg and with Supporting Structures.	SET	7	.0038989
K.8.1	Generator circuit breaker (GCB) below generator Rating 23595 A, 21 kV size app. 7000mm x 4000 mm x 4000 mm along with centralizing cubicle and overall weight - 10067 kg.	SET	1	.0020704
L.6	Unit Control Panel(UCP)- approx panel size 2216(L) x1000(W) x 2355(H) approx weight 900 kg	No.	1	.000557
L.7	Unit Electrical Control Panel(UECP)- approx panel size 2792 (L)x 1000(W) x 2355(H) , approx weight 900 kg	No.	1	.000557
L.8, L.9	EDMS/IEMS (CYJ-01,CYJ-02 & CYJ03) electrical interface system panel size 750(L) x750(W) x 2067(H) approx weight 400 kg each along with HMI items i.e Server,OWS,EOWS,Printer,Cable ,etc.	SET	1	.0006574

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
L.1	Digital AVR consisting of 2No. Regulation cubicle, 1 No. Thyristor cubicle & 1 No. Field suppression cubicle, and associated loose supplied items including laying & termination of loose supplied power & control cables for DAVR system. DAVR Overall dimension: 4053 (L)x 800 (W)x 2415(H) mm Aproximate wt. : 3000 Kg. * Lump sum rate to be quoted.	SET	1	.0017688
V	LAYING OF HT CABLES 11KV (UE) ARMOURED; ALUMINIUM CONDUCTOR ,XLPE INSULATED PVC/FRLS OUTER SHEATHED CABLE.	--		
K.1.1	--	Mtrs	12,500	.0143127
K.1.2	--	Mtrs	34,250	.0237365
K.1.3	--	Mtrs	18,000	.0214238
VI	LAYING OF HT CABLES 3.3KV (UE) ARMOURED; ALUMINIUM CONDUCTOR ,XLPE INSULATED PVC/FRLS OUTER SHEATHED CABLE.	--		
K.2.1	--	Mtrs	9,000	.0067797
K.2.2	--	Mtrs	10,250	.0120453
VII	Installation of Cable termination and joint kits for 11/11 KV (UE) GRADE, XLPE Insulated aluminium conductor armoured cables for the following sizes.	--		
K.3.1, K.4.1,	Termination/Joint Kit for 1C x 630 sqmm	Nos.	57	.0037442
K.3.2, K.4.2,	Termination/Joint Kit for 1C x 300 sqmm	Nos.	182	.0072663

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.3.3, K.4.3	Termination/Joint Kit for 3C x 185 sqmm	Nos.	79	.0055333
VIII	Installation of Cable termination kits and joint kit for 3.3 KV (UE) GRADE, XLPE Insulated aluminium conductor armoured cables for the following sizes.	--		
K.5.1, K.6.1	Termination KIT/Joint KIT 3.3 KV 1C-240 sqmm AL ARM (indoor) AL LUG	Nos.	87	.0053242
K.5.2, K.6.2	Termination KIT/Joint KIT 3.3 KV 3C-185 sqmm AL ARM (indoor) AL LUG	Nos.	62	.0041427
IX	INSTALLATION OF HOT DIP GALVANIZED STEEL FLATS	--		
K.7.1	--	Mtrs	4,200	.0074667
K.7.2	--	Mtrs	5,100	.0059933
K.7.3	--	Mtrs	875	.0009228
K.7.4	--	Mtrs	450	.0004746
K.7.5	--	Mtrs	1,700	.0001281
X	FABRICATION & ERECTION OF STRUCTURAL STEEL	--		

**Part C : Bill of Quantities**

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.10.1	Structural Steel (ISMC, ISMB, ISA, etc)	MT	47	.0124902
K.10.2				
K.10.3				
K.10.4				
XI	COMMISSIONING OF THE FOLLOWING ERECTED BY MECHANICAL CONTRACTOR	--		
K.9.1	--	SET	1	.0027265
K.9.2	--	No.	1	.0000516
K.9.3	--	No.	1	.0000516
K.9.4	--	No.	1	.0000436
K.9.5	--	No.	1	.0000436
K.9.6	11 KV HT drives	Nos.	10	.0018162
K.9.7, K.9.8	3.3 KV HT Drives	Nos.	50	.0047367
XII	LAYING OF LT POWER / CONTROL CABLES 1.1KV, XLPE INSULATED, GALVANISED STEEL ARMoured SINGLE/MULTICORE CABLES FRLS PVC. (AL/CU CABLES)	--		
L.2	3C x 50 sqmm copper (Excitation + power input)	Mtrs	800	.000217

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
L.4	1Cx 70 sqmm copper (earthing)	Mtrs	100	.0000271
XIII	END TERMINATION OF LT POWER / CONTROL CABLES -1.1KV PVC/FRLS ARMoured AL/CU CONDUCTOR PVC INSULATED, FRLS OUTER SHEATHED.	--		
L.3	3C x 50 sqmm copper (Excitation + power input)	Nos.	16	.0000704
L.5	1Cx 70 sqmm copper (earthing)	Nos.	4	.0000039
XIV	LAYING AND TERMINATION OF INSTRUMENTATION CABLES	--		
G.4.9	OFC cable includes fixing of fibre optic components and termination kits LIU, face plates,cabinets,SC coupler,grounding etc	Mtrs	20,000	.0069304
G.4.10	OFC Cable splicing	Nos.	75	.000139
G.4.11	D link 4 pair PVC, CAT 5 Lan cable	Mtrs	6,000	.0006328
XV	ERECTION OF MISCELLANEOUS ITEMS	--		
K.7.6, M.1	Flexible braided copper conductor with copper clamp for gate earthing & Earthing with MS earth rod 40 mm (Below ground earthing system)	Mtrs	157	.0001798
K.7.7	Treated Earth pit of Galvanized MS pipe 3000 m long with funnel and accessories including all civil works, filling of earth pit with alternate layer of chrcoal & salt as per IE specification and making of brick chamber, with both side plastering, supply and fising of manhole CI cover plate/RCC Slab etc. complete as per IS 3043 (only 100 mm GI pipe shall be supplied by BHEL)	SET	64	.0086057

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**at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
<b>TOTAL Weightage</b>				1.0