TAMIL NADU TRANSMISSION CORPORATION LIMITED

ABSTRACT

TANTRANSCO – Enhancement of existing power transformer capacity from 3x16 MVA to 1x25+2x16 MVA at Thiruchitrambalam 110/22 kV SS in Villupuram Operation Circle (Villupuram EDC) of Villupuram region – Administrative approval – Accorded

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TECHNICAL BRANCH

(Per) CH TANTRANSCO Proceedings No. 52

Dated: 08.05.2026
Parabhaava Varudam
Chithirai - 25
Thiruvalluvar Aandu 2057

READ: Chairman's approval dated : 05.05.2026

PROCEEDINGS:

1. The Tamil Nadu Transmission Corporation Limited hereby approves the proposal for enhancement of existing power transformer capacity from 3x16 MVA to 1x25+2x16 MVA at Thiruchitrambalam 110/22 kV SS in Villupuram Operation Circle (Villupuram EDC) of Villupuram region at an estimated cost of Rs.556.17 Lakhs Gross and Rs. 534.50 Nett. subject to the condition that no further loads shall be connected at Thiruchitrambalam 110/22 kV SS in order to maintain system reliability and meet the (N-1) condition. The detailed estimate and report are annexed to these proceedings.
2. The expenditure is chargeable to TANTRANSCO - Funds - Capital Expenditure – Villupuram Operation Circle (Villupuram EDC) - A/C code No: 1020400.
3. By virtue of the provisions contained in sub-section (2) (a) of section 185 of the Electricity Act, 2003, TANTRANSCO being the Transmission utility, Licensee and successor entity of Tamil Nadu Electricity Board will exercise the powers of the Telegraph Authority under the provisions of section 164 of the Electricity Act, 2003, which have already been conferred upon the Board under section 51 of the Indian Electricity Act, 1910.

4. The works will be taken up after ensuring necessary budget provision.

// BY ORDER OF THE CHAIRMAN//

J.PREMALATHA

CHIEF ENGINEER/TRANSMISSION

Encl: Report and detailed estimate.

To

The Chief Engineer/Distribution/ Villupuram Region

Copy to:

The Managing Director/TANTRANSCO, Chennai-2.

The Director/ Transmission Projects/ TANTRANSCO, Chennai-2.

The Director/Operation/TANTRANSCO/Chennai -2

The Director /Finance/TANTRANSCO, Chennai-2

The Director /Distribution, TNPDCL, Chennai-2.

The Director /Finance, TNPDCL, Chennai-2

The Chief Engineer/TP & SO/Chennai -2

The Chief Engineer/Civil Transmission/Chennai -2

The Superintending Engineer /GCC I/ Chennai

The Superintending Engineer/Operation/ Villupuram

The Superintending Engineer/ Villupuram EDC

The Chief Financial Controller/General/ TANTRANSCO, Chennai-2.

The Chief Internal Audit Officer/TANGEDCO, Chennai-2.

The Deputy Secretary,TANTRANSCO, Chennai-2.

The Superintending Engineer/Transmission -I/Chennai -2

The Superintending Engineer/Transmission -II/Chennai -2

The Superintending Engineer/System Studies/Chennai -2

The Resident Audit Officer (AGO'S Unit)/Chennai -2

B.P.Section (Administrative Branch)

Stock file

// FORWARDED BY ORDER//

08/05/2026

EXECUTIVE ENGINEER/MASTER PLAN II

Enclosure to (Per) CH TANTRANSCO Proceedings No. 52 , dated : 08.05.2026

REPORT TO ACCOMPANY THE ESTIMATE

This proposal envisages enhancement of existing power transformer capacity from 3x16 MVA to 1x25+2x16 MVA at Thiruchitrambalam 110/22 kV SS in Villupuram Operation Circle (Villupuram EDC) of Villupuram region at an estimated cost of Rs.556.17 Lakhs Gross and Rs. 534.50 Nett. subject to the condition that no further loads shall be connected at Thiruchitrambalam 110/22 kV SS in order to maintain system reliability and meet the (N-1) condition.

Need:

Thiruchitrambalam 110/22 kV SS is having 3x16 MVA power transformers. The combined sustained peak reached on the existing 110/22 kV power transformers at this SS is 43.24 MVA which is loaded to 90.08 % of its capacity. Load growth of the SS is 10.27%.

Partial load transfer can be made to only nearby Vanur 110/22 kV SS which is having (1x10+1x16) MVA power transformers which are loaded to 60.08% of it's capacity (15.62 MVA).

The salient features of 22 kV feeders fed off from Thiruchitrambalam 110/22 kV SS are given below:

Name of the 22 kV feeder	CL in MVA	Length in km	MD reached in MVA	Voltage regn in %
Kottakuppam	9.049	12.842	7.62	7.750
Pillaichavadi	13.011	12.005	6.85	7.589
Kadaperikuppam	11.856	12.109	5.33	7.769
Auroville	16.812	17.54	8.38	18.546
Kazhuperumbakkam	5.766	10.358	4.19	4.638
Nesal	13.361	12.003	7.81	7.710
Aurofood	13.322	9.063	4.95	5.270
Ozhindiyampattu	11.335	12.862	6.28	9.210
Thirunagar	24.881	1.346	9.52	12.014

From the above, it is observed that the voltage regulation of 22 kV Auroville, 22 kV Ozhindiyampattu and 22 kV Thirunagar feeder have exceeded the permissible limit of 8%. The Chief Engineer/Distribution/Villupuram region has reported that the tail end voltage of 22 kV Auroville feeder will be reduced within permissible limit after load bifurcation to the newly proposed 110/22 kV SS at Bommaiyarpalayam. Further, the bifurcation of 22 kV Thirunagar feeder has been proposed to form additional new feeder namely Pothurai feeder and the work is under progress. In case of 22 kV Ozhindiyampattu feeder, Non-Agri feeder segregation has been proposed under RDS Scheme and the work is under progress.

The SE/GCC/Trichy has reported that the existing plinth of 16 MVA power transformer is adequate to accommodate the proposed 25 MVA enhancement. The additional 110 kV GC breaker can only be provided by using 110 kV 1x630 sq.mm XLPE UG cable for outgoing supply extension from 110 kV GC II breaker to 110 kV power transformer strung bus.

Hence, in order to avoid overloading of the existing power transformers, to provide uninterrupted supply and to meet the (N-1) condition, it becomes necessary to enhance the existing power transformer capacity from 3x16 MVA to 1x25+2x16 MVA at Thiruchitrambalam 110/22 kV SS and is the only economical way.

Adequacy of Transmission system:

Details of the source SS:

a	Name of the source SS	Villupuram 230/110 kV SS
b	Capacity of the existing auto tr.	2x160 MVA
c	Present peak reached in MVA	230 MVA
d	Whether the auto tr. capacity is adequate: As per the load flow study results, source SS is adequate.	

Details of the source feeder:

a	Name of the feeder	110 kV Villupuram – Madurapakkam II feeder
b	Size/Loading capacity of the conductor	Panther – 84 MVA
c	Present loading in MVA	72 MVA
d	Whether the conductor is adequate:	As per the load flow study results, 110 kV feeder overloading has been observed. However, the 110/22 kV power transformer enhancement from 3x16 to 2x16+1x25 MVA, at Thiruchitrambalam 110/22 kV SS may be considered in order to maintain system reliability and meet the (N-1) condition of 110/22 kV power transformers at Thiruchitrambalam 110/22 kV SS subject to the condition that no further loads shall be connected at Thiruchitrambalam 110/22 kV SS.

The proposed loads that will be incident after enhancement of power transformer is given below :

Sl.No.	Name of the SS/EHT feeder	Capacity/ Sanctioned load	Present peak reached	Load transfer to the enhanced transformer	Anticipated peak
1	Thiruchitrambalam 110/22 kV SS	3x16 MVA	43.24 MVA	The power transformer will be connected in parallel to the existing power transformers to avoid overloading and to share the load	43.24 MVA

Details of work:

- Erection of 1 no. 25 MVA, 110/22 kV power transformer and its associated equipments at Thiruchitrambalam 110/22 kV SS.
- Erection of 1 No. 110 kV GC Breaker along with its associated equipments at Thiruchitrambalam 110/22 kV SS.
- Dismantling of 1 No. 16 MVA, 110/22 kV power transformer at Thiruchitrambalam 110/22 kV SS.
- Supply and erection of 110 kV, 1x630 sq.mm UG Al Cable for a route length of 0.45 km.

08/05/2026

EXECUTIVE ENGINEER/MASTER PLAN II

Detailed estimate for enhancement of existing 110/22 kV power transformer capacity from 3x16 MVA to 1x25+2x16 MVA at Thiruchitrambalam 110/22 kV SS in Villupuram Operation circle (Villupuram EDC)

Part I: Cost of new asset chargeable 1020400

RUPEES IN LAKHS

Sl. No.	Description	Quantity	Rate	Per	Amount in Lakhs	Total in Lakhs
I	**Civil Works**					
1	Civil works such as earth work excavation,plinth for power transformer and breakers, cable duct for 110 kV UG cable,quarry duct filling, metal spreading, painting, sand filling,filling gravel,etc.			LS	31.514	
2	Total (including contingencies @1%, Establishment & Supervision charges @15% & GST @18%)			LS	37.558	**37.558**
II	**Electrical Works**					
1	110 kV AB switch w/o earth blade	4 Nos	1.814	E	7.256	
2	110 kV SF6 breaker	1 No.	5.648	E	5.648	
3	110 kV CT	3 Nos	1.665	E	4.995	
4	Control & Relay Panel			LS	5.000	
5	Control cable			LS	3.000	
6	Earthing &Yard lighting			LS	3.000	
7	110 and 22 kV Structure modification and re-engineering works (busbar arrangements, jumpering arrangements,clamps and connectors etc.) inclusive of all				20.000	
8	Cost of materials				48.899	
9	Contingencies 1%				0.489	
10	Sub total				49.388	
11	Labour and Transport charges @ 15%				7.408	
12	Sub total for material,labour & transport (A)				56.796	
13	25 MVA, 110/22 kV power transformer with OLTC	1 No	242.939	E	242.939	
14	Labour and Transport charges	1 loc	10.000	loc	10.00	
15	Earthing	1 loc	0.500	loc	0.500	
16	Sub total for material,labour & transport (B)				253.439	
17	Sub total (A)+(B)				310.235	
18	**UG CABLE WORK**					
19	Supply of 110KV, 1x630 sq.mm Aluminium XLPE UG cable and accessories for a route length of 0.45 kms as per Annexure-I				80.59	
20	Erection charges of 110 kV, 1x630 sq.mm UG cable as per Annexure-I				15.453	
21	Cost of cable works				96.047	
22	Contingencies 1%				0.960	
23	Sub total C				97.008	

Detailed estimate for enhancement of existing 110/22 kV power transformer capacity from 3x16 MVA to 1x25+2x16 MVA at Thiruchitrambalam 110/22 kV SS in Villupuram Operation circle (Villupuram EDC)

24	SUBTOTAL (A+B+C)				407.243	
25	Establishment & Supervision charges @15%				61.086	
26	Sub total				468.329	
27	Add dismantling charges				3.000	
28	Sub total				471.329	
29	GST @18%				84.839	
30	**Total (Electrical)**				**556.169**	**556.169**
31	**Total (Electrical & Civil)**				**593.727**	
32	Less credit				59.224	
33	**Total (Nett)**				**534.50**	

Part I (a):Dismantling charges Chargeable 4021137 = 3.00 lakhs

Part II: Accumulated Depreciation Chargeable 1011300

Sl.No	Description	Qty	Original cost of asset in lakhs	Full life period	Useful life period	Acc.Dep = 0.9*(col.4*col. 6/col.5)
1	16 MVA, 110/22 kV Power Transformer	1	59.224	25	25	53.301
2	Total		59.224			53.301

Part III Devolution of old equipment to store

Part III = Part IV - Part II = **5.92** lakhs

Part IV Removal of old assets Chargeable 10103

Sl.No	Description	Qty	Original cost in lakhs *	Original erection charges	Original centage	Original cost of asset in lakhs
1	16 MVA, 110/22 kV Power Transformer (PO.TR.724(101)/1999)	1	46.817	4.682	7.725	59.224
2	Total					59.224

* 2000 - 2001 cost data rate

Rs. In Lakhs

Abstract		
Part I: New Asset Chargeable	Gross	556.17
	Nett	534.50
Part I (a): Dismantling charges Chargeable		3.00
Part II: Accumulated Depreciation Chargeable		53.30
Part III: Devolution of old equipment to store		5.92
Part IV: Removal of old assets Chargeable		59.22

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EXECUTIVE ENGINEER/MASTER PLAN II

ANNEXURE-I

NAME OF WORK : Supply, Erection, testing and commissioning of 110 KV,1x630 sqmm , Al, XLPE UG cable and accessories

SUPPLY OF MATERIALS

Sl. No	Name of Materials	Qty		Rate		Amount
1	110 KV, 1x630 Sqmm XLPE Alu cable	0.45	Km	8817915.33	Km	3968061.90
2	Out door terminaton kit for 110 KV 630 Sqmm XLPE cable	6.00	Nos.	528758.02	Nos.	3172548.12
3	Link box Three phase without CCPU	2.00	Nos.	58660.30	Nos.	117320.60
4	Link box three phase with CCPU	2.00	Nos.	58338.62	Nos.	116677.24
5	6.35/11 KV , 400 sq mm Sheath bonding cable	0.10	km	4769350.010	Km	476935.00
6	Non magnetic Spring loaded double compression loaded type clamp for 110 KV, 630 Sq.mm XLPE UG Cable	10.00	Nos.	1400.00	E	14000.00
7	Supply of 110 KV LAS with monitor	6.00	Nos.	32310.00	E	193860.00
	Total					**80,59,402.86**

LABOUR CHARGES .

1	Erection & company supervision of Outdoor termination kits including link box and earthing	6	Nos.	68192.00	Each	409152.00
2	Erection & company supervision of LAS including earthing	6	Nos.	65611.00	Each	393666.00
3	Labour Charges for Laying of 110 KV, 1x630 Sqmm XLPE Alu cable	450	m	1650.00	m	742500.00
	Total					**1545318.00**

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EXECUTIVE ENGINEER/MP II