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KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

CIN No. U40109KA1999SGC025521

Corporate Office
Kaveri Bhavan, K.G Road,
Bengaluru - 560 009

No. KPTCL/B19/345/85-86

Date: 01.06.2022

CIRCULAR

Sub: Standardization of Tower designs to be adopted for construction of 66kV Transmission Lines in case of Turnkey/Partial Turnkey/DCW works of KPTCL and all Self-execution works - reg.

- Ref:**
- 1) Corporate Circular No. KPTCL/B19/345/85-86 dated 25.06.2021.
 - 2) Corporate Circular No. KPTCL/B19/345/85-86 dated 19.08.2021.
 - 3) Note of CEE(P&C), KPTCL dated 05.05.2022.
 - 4) Note approved by the Managing Director, KPTCL on 30.05.2022.

Corporate Circular dated 25.06.2021 and amendment dated 19.08.2021 has been issued for adoption of new 110kV DC towers of M/s. Kalpataru design adopted for the work of establishing 2x100MVA, 220/110/11kV Sub-station in the premises of M/s. AEQUS SEZ Pvt Ltd (Code: KPTCL-1D-AEQUS).

The existing 66kV DC Transmission Line Towers being used for various Transmission Line works presently are of M/s. Kalpatharu design and have been designed as per the old code IS:802 (Part-I)-1977.

However, it is observed that these 66kV Transmission Towers are highly vulnerable to the present high wind loads especially due to whirl wind loads during monsoon season which has led to failure of many Towers. The major limitations of these type of Transmission Towers are space requirement (wider base-RoW issues), mechanical strength, problems faced by field staff during tower erection, repeated failure of towers during heavy winds and other technical parameters.

Hence, in order to overcome the difficulties, Corporation has taken a decision to adopt Transmission Line Towers with robust structural design with optimum space requirement as per the latest version of Indian Standards IS:802 (Part-I/Sec-I)-2015, IS:802 (Part-I/Sec-II)-2016 & CBIP Manual.

Accordingly, 66kV DC towers were designed as per the latest Indian Standard IS:802 (Part-I/Sec-I)-2015, IS:802 (Part-I/Sec-II)-2016 & CBIP Manual by Turnkey contractor, M/s. KGN Electricals, Tumakuru, for the work of construction of 66kV DC Line for establishing 2x100MVA, 220/66/11kV Sub-station at Nagamangala (Karadihalli) in Nagamangala Taluk, Mandya District.

The newly designed 66kV DC Towers (DA, DB, DC & DD type) have been evaluated and the same have been successfully prototype tested at M/s. CPRI, Bengaluru

Henceforth, the following shall be scrupulously followed for construction of 66kV SC/DC Transmission Lines in case of Turnkey/Partial Turnkey/DCW works of KPTCL and all Self-execution works:

1. The existing 66kV DC tower design of M/s. Kalpataru is made obsolete and shall not be used for construction of 66kV Transmission Lines.
2. The newly designed 66kV DC towers by M/s. KGN Electricals for the project work of establishing 2x100MVA, 220/66/11kV Sub-station at Nagamangala in Nagamangala Taluk, Mandya District is standardized and shall only be used for construction of 66kV SC/DC Transmission Lines in case of Turnkey/Partial Turnkey/DCW works executed by KPTCL and all Self-execution works.
3. This Tower design shall be coded as **KPTCL-6D-NGML**.

The technical parameters for new designs with weight of tower structures and volumes for excavation and concreting in respect of 66kV DC Towers as annexed to this Circular (Annexure A&B) shall be adopted for estimation as well as for construction of 66kV SC/DC Transmission Lines along with the works under the stage of **planning / survey / estimate / DPR preparation / Tendering** with immediate effect.

For DPRs approved with old 66kV DC Towers of Kalpataru design, during tendering the weight of tower structures and volumes for excavation and concreting of newly designed 66kV DC Towers with code: KPTCL-6D-NGML shall be adopted.

For Self-execution works, if the tenders for construction of Transmission Lines on Self-execution basis are invited prior to issue of this Circular (for which detailed survey reports are already approved), such works shall be executed as per the tenders already awarded.

The above shall come into effect from the date of issue of this Circular.

Any clarifications on the above shall be obtained from SEE (Technical)/SEE (Civil),
O/o Chief Engineer Elec, P&C, KPTCL, Kaveri Bhavan, Bengaluru.

Approved by
Managing Director

BR 11/16/22
General Manager (Tech)
KPTCL

To:

1. All Chief Engineers Electricity, KPTCL
2. All Financial Advisors, KPTCL
3. All Superintending Engineers, Elec., KPTCL
4. All Controllers of Accounts, KPTCL
5. All Executive Engineers, Elect., KPTCL
6. All Deputy Controller of Accounts, KPTCL
7. SPS to Managing Director / Director (Transmission) / Director (Finance) / Director (A&HR) / Company Secretary / KPTCL, Kaveri Bhavan, Bengaluru.

Copy to:

1. The Superintending Engineer (Elect.), IT & MIS, with a request to arrange to upload this Circular in KPTCL website.

Details of Approved tower weights for 66KV D/C Transmission line towers to be adopted as per circular (Design Code : KPTCL-6D-NGML)

Type of Tower		Base width in Mtrs.	Tower weight in Kgs		Bolts, Nuts & Washers in kgs	Stub weight in kgs		Bolts, Nuts & Washers in kgs
			HT	MS		HT	MS	
DA (0 - 2deg)	NT	3.00	1145.00	1240.00	170.36	104.80	-	1.60
	3 ME	3.42	217.52	219.56	28.81			
	6 ME	3.84	447.92	453.56	57.63			
DB (0 - 15deg)	NT	4.00	1620.50	1020.24	177.10	144.32	-	3.19
	3 ME	4.63	370.72	195.76	37.07			
	6 ME	5.26	813.00	367.20	74.14			
DC (15 - 30deg)	NT	4.50	1595.76	1348.76	201.30	191.32	-	3.38
	3 ME	5.20	481.84	174.36	37.76			
	6 ME	5.90	997.84	371.24	76.27			
DD (30 - 60deg) & DE: (0 - 15deg)	NT	5.00	2197.90	1227.70	209.02	218.56	-	5.08
	3 ME	5.77	498.68	256.40	37.83			
	6 ME	6.55	1052.48	533.12	75.66			

DESIGN PARAMETERS:

1. The Towers are designed for:

Wind Zone - 1 (33 m/s)

Reliability Level - 1

Terrain category - 2

Normal Span Length : 275M

Coyote ACSR conductor & 7/3.15mm size earth wire

Weight Span details:

Particulars		DA	DB	DC	DD	DE
NC	Max.	550	550	550	550	550
	Min.	140	-550	-550	-550	-550
BWC	Max.	330	330	330	330	330
	Min.	70	-330	-330	-330	-330

Maximum Conductor Temperature : 85°C


Maximum Ground wire Temperature : 53°C

Tension at 32°C & FW : 1974Kgs

Tension at 32°C & NW : 1156Kgs

Maximum Sag at 85°C & NW : 6.168Mts

Bottom cross arm height from G.L : 12.60M


 Superintending Engineer (Elec.) Technical
 Technical Section
 O/o. Chief Engineer, Electricity,
 (Planning & Co-ordination)
 E.P.T.C.L., Kaveri Bhavan, Bangalore.

BOQ AS PER THE APPROVED DESIGN FOR 66KV DC TOWERS ADOPTED IN THE PROJECT OF ESTABLISHING 220KV SUBSTATION AT NAGAMANGALA(KARADAHALLY) NAGAMANGALA TALUK MANDYA DISTRICT.													
Tower Type	NDS	WBC	FSS	PSS	WET	DFR	SFR	PSFR	WFR	HR	1:03:06 Cmtr	M20 Cmtr	Steel Kgs
DA (NT,+3m,+6m)	24.95										0.29	3.37	113.24
		90.82									1.35	8.12	297.71
			53.22	39.82							0.74	4.97	174.54
					31.21						0.52	4.17	145.55
						16.07					0.39	3.67	124.79
							37.92		25.08		0.29	3.37	113.24
DB(NT,+3m,+6m)	30.72	130.68									0.34	3.87	124.09
			81.12								1.80	10.22	337.73
				60.75							1.05	6.89	229.51
					50.43						0.76	5.63	185.68
						17.96					0.61	5.00	165.82
							61.97				0.45	4.38	143.33
DC(NT,+3m,+6m)	38.88	147.00									1.30	8.05	276.22
			94.08								0.92	6.42	227.65
				72.03							0.68	5.39	178.18
					58.08								
						19.45							
							73.34		51.54				

