



भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

पावर कम्युनिकेशन डेवलपमेंट प्रभाग

Power Communication Development Division

No.: CEA/PCD/PTCC/AND-676/45-48

Date: 14.01.2019

The Divisional Engineer Telecom,
PTCC, T&D circle, BSNL,
No.26, 1st floor, Raj Bhavan Exchange,
Sardar Patel Road,
Guindy, Chennai-600032

Subject: Induced Voltage calculation in respect of PTCC proposal for 400 kV D/C Kadapa – Madhugiri Transmission Line

Reference: i) BSNL letter no. SR-PTCC/SAP-1815/07 dated 28.02.2018
ii) South Central Railway letter no. SG.85/4/3/PTCC/SCRAP201835 RTD dated 17.09.2018
iii) South Western Railway letter no. SG/SWR/PTCC/KDP-MDG/1789/14 dated 10.10.2018

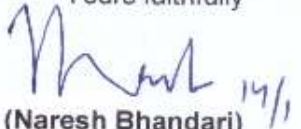
Sir,

The instant PTCC proposal has been examined. The low frequency induction on telecom cables of BSNL and Block & Telecom circuits of South Central Railway and South Western Railway with respect to details furnished vide above references has been computed. The Average Soil Resistivity (SR) value has been taken as 25,000 Ohm-cm, as intimated by the Power Authority (PGCIL). The voltages likely to be induced on paralleling telecom cables of BSNL, and Block & Telecom circuits of South Central Railway and South Western Railway under Single Line to Ground (SLG) fault condition have been computed and are enclosed at Annex-I, II and III respectively. The screening factors, as applicable, have been considered. Telecommunication details from Defense are pending and the power authority has shown urgency for charging the line. In view of this, you are requested to issue provisional PTCC route approval.

Encl.: As above

m/c

Yours faithfully


(Naresh Bhandari)
Chief Engineer

Copy to:

1. GM(S&T), South Central Railway, Head Quarters Office, Signal & Telecom Branch, Rail Nilayam, Secunderabad, Telangana – 500025 (Annex – II only)
2. PCSTE, South Western Railway, 1st Floor, West Block, Rail Soudha, Gadag Road, Hubli, Karnataka – 580020 (Annex – III only)
3. Manager, PGCIL, CAO, No. 1/1160-C, Shivalayam Street, Near College circle, Kadiri, Andhra Pradesh - 515591



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Power Communication Development Division

सं. के.वि.प्रा. /पीसीडी /पीटीसीसी /एएनडी-676

दिनांक: 14.01.2019

डिवीजनल इंजीनियर टेलीकॉम (पीटीसीसी),

क्यू ए एंड इंस्पेक्शन (टी एंड डी) सर्कल, बीएसएनएल,

1 तल, राज भवन एक्सचेंज,

नं 26, सरदार पटेल रोड,

गुडंडी, चेन्नई -600032

विषय: पीटीसीसी प्रस्ताव - 400 केवी डीसी कडपा - मधुगिरी ट्रांसमिशन लाइन - प्रेरित वोल्टेज गणना

संदर्भ: i) बीएसएनएल का पत्र संख्या SR-PTCC/SAP-1815/07 दिनांक 28.02.2018

ii) दक्षिण मध्य रेलवे पत्र संख्या SG.85/4/3/PTCC/SCRAP201835 RTD दिनांक 17.09.2018

iii) दक्षिण पश्चिम रेलवे पत्र संख्या SG/SWR/PTCC/KDP-MDG/1789/14 दिनांक 10.10.2018

महोदय,

उपरोक्त पीटीसीसी प्रस्ताव की जांच की गई है। बीएसएनएल एवं रेलवे के दूरसंचार केबलों पर कम आवृत्ति प्रेरण के संबंध में गणना की गई है। औसत मृदा प्रतिरोधकता (एसआर) 25,000 ओम-सेमी लिया गया है, जैसा कि बिजली प्राधिकरण (पॉवरग्रिड) द्वारा सूचित किया गया है। बीएसएनएल के दूरसंचार केबलों, एवं दक्षिण मध्य रेलवे तथा दक्षिण पश्चिम रेलवे के ब्लॉक एवं टेलिकॉम सर्किटों पर प्रेरित वोल्टेज की गणना क्रमशः अनुलग्नक- I, II एवं III में संलग्न हैं। स्क्रीनिंग कारकों का मान यथानुरूप लिया गया है। डिफेन्स टेलिकॉम विवरण के.वि.प्रा. में प्राप्त नहीं है परन्तु पॉवरग्रिड द्वारा लाइन चार्जिंग की तत्काल आवश्यकता जताई गयी है। अतः आपसे अनुरोध है कि अस्थायी पीटीसीसी रुट अनुमोदन के लिए आवश्यक कार्यवाही करें।

संलग्न : उपरोक्त अनुसार

आपका आभारी,

14/1

(नरेश भंडारी)

मुख्य अभियन्ता

कॉपी:

1. जीएम (एसएंडटी), दक्षिण मध्य रेलवे, मुख्यालय कार्यालय, सिग्नल और टेलीकाम शाखा, रेल निलयम, सिकंदराबाद -500025 (अनुलग्नक II के साथ)
2. प्र.मु.सं.एवं.दूसं अभियंता, दक्षिण पश्चिम रेलवे, प्रथम मंजिल, पश्चिम विभाग, रेल सौधा, गदग सड़क, हुबली - 580020 (अनुलग्नक III के साथ)
3. प्रबंधक, पॉवरग्रिड, CAO, नं. 1/1160-C, शिवालयम रोड, कॉलेज सर्किल के पास, कदिरि, आन्ध्र प्रदेश - 515591

ANNEXURE - I

Case No.: AND-676					
Name of the Power Line : 400 kV D/C Kadapa – Madhugiri Transmission Line		Map Scale : 1 cm = 500 m			
		Length of Line : 238.400 km			
		Avg S.R. Value : 25,000 Ohm-cm			
Sl. no.	Name of Telecom Line	Length of Parallelism in KMs	Mutual Coupling in Ohms	Fault Current in Amps	Induced Voltage in Volts

BSNL DETAIL					
Ref. No: SR-PTCC /SAP-1815/07		DATED: 28-02-2018			

MAP 1 of 7

I	BELLAVI Exge (B) UG cables				
1	B-B1(Exge to Majjigekempanahalli)	IV LESS THAN 430 V			
2	B-B2(Exge to Doddaveeranahalli)				
3	B-B3(Exge to Asalipura)				
4	B-B4(Exge to T Gollahalli)	OUT OF PARALLELISM			
5	B-B5(Exge to Chikkabellavi)				
6	B-B6(Exge to Ballapura)	IV LESS THAN 430 V			
7	B-B7(Exge to Agalakunte)				
II	KORA Exge (G) UG cables				
1	G-G1(Exge to Karikere)	IV LESS THAN 430 V			
2	G-G2(Exge to Aralakatte)				
3	G-G3(Exge to Burudaghatta)				
4	G-G4(Exge to Kalasegowdanapalya)				
5	G-G5(Exge to Bommanahalli)				
6	G-G6(Exge to Hanchihalli)				
7	G-G7(Exge to Muddenahalli)				
III	NELAHAL Exge (C) UG cables				
1	C-C1(Exge to Thippedasarahalli)	IV LESS THAN 430 V			
2	C-C2(Exge to Haldodderi)				
3	C-C3(Exge to Majjigekempanahalli)				
4	C-C4(Exge to Kempanadodderi)				
5	C-C5(Exge to Mallenahalli)				
6	C-C6(Exge to Lakkanahatti)				
7	C-C7(Exge to Kemdanahalli)				
8	C-C8(Exge to Power Grid)				
9	C-C9(Exge to Kisan Moulding)				
10	C-C10(Exge to Vectus)				
IV	KORATAGERE Exge (K) UG cables				
1	K-K1(Exge to Tumbadi)	IV LESS THAN 430 V			
2	K-K2(Exge to Dasarahalli)	2.8	0.0478	13000	621
3	K-K3(Exge to Gatlahalli)	IV LESS THAN 430 V			
4	K-K4(Exge to Veerobanahalli)				
5	K-K5(Exge to Tarati)				
6	K-K6(Exge to Vaddagere)				
7	K-K7(Exge to Hulikunte)				
V	MALLEKAVU Exge(M) UG cables				
1	M-M1(Exge to Budagavi)	IV LESS THAN 430 V			
2	M-M2(Exge to C N Durga)	2.2	0.0603	10000	603

ANNEXURE - I

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		Avg S.R. Value : 25,000 Ohm-cm			
Sl. no.	Name of Telecom Line	Length of Parallelism in KMs	Mutual Coupling in Ohms	Fault Current in Amps	Induced Voltage in Volts

VI	TOVINAKERE Exge (T) UG cables				
1	T-T1(Exge to Marenayakanahalli)				
2	T-T2(Exge to Kesturu)				
3	T-T3(Exge to Devalapura)				
4	T-T4(Exge to Kabbigere)				
IV LESS THAN 430 V					
MAP 2 of 7					
I	HINDUPUR Exge (HDP) UG cables				
1	HDP Exge - Rahmathpur Pillar (P37) - II Town Police station DP (DP- 370027)				
2	HDP Exge - Model Colony Pillar (P92) -Loyala College DP (DP- 920011)				
IV LESS THAN 430 V					
II	MADHUGIRI Exge (M) UG cables				
1	M-M1(Exge to Sompura)				
2	M-M2(Exge to Kambattanahalli)				
3	M-M3(Exge to Siddapura)				
4	M-M4(Exge to Keragalapalya)				
5	M-M5(Exge to Settihalli)				
6	M-M6(Guruvarahalli road)				
IV LESS THAN 430 V					
III	PURAVARA Exge(P) UG cables				
1	P-P1(Exge to Sankapura)				
2	P-P2(Exge to Kodlapura)				
3	P-P3(Exge to Gonde Halli)				
4	P-P4(Exge to Gamkarna Halli)				
IV LESS THAN 430 V					
IV	BYALYA Exge (B) UG cables				
1	B-B1(Exge to Handralu)				
2	B-B2(Exge to Taggihalli)				
3	B-B3(Exge to Dodda Hosahalli)				
4	B-B4(Exge to Vaddarahatti)				
5	B-B5(Exge to Kodagadala)	3.7	0.0461	12000	553
6	B-B6(Exge to Hanumanthapura)	1.1	0.0397	12000	476
V	SRAVANDANA HALLI Exge (S) UG cables				
1	S-S1(Exge to Kalidevapura)				
2	S-S2(Exge to Hampasandra)				
3	S-S3(Exge to Chandanuru)				
4	S-S4(Exge to Tingluru)				
IV LESS THAN 430 V					
VI	KODIGENA HALLI Exge (K) UG cables				
1	K-K1(Exge to Teriyur Road)				
2	K-K2(Exge to Gutte)				
3	K-K3(Exge to Reddihalli)				
4	K-K4(Exge to Doddamalur)				
5	K-K5(Exge to Kalidevapura Road)				
IV LESS THAN 430 V					

ANNEXURE - I

Case No.: AND-676					
Name of the Power Line : <u>400 kV D/C Kadapa – Madhugiri Transmission Line</u>		Map Scale : 1 cm = 500 m Length of Line : 238.400 km Avg S.R. Value : 25,000 Ohm-cm			
Sl. no.	Name of Telecom Line	Length of Parallelism in KMs	Mutual Coupling in Ohms	Fault Current in Amps	Induced Voltage in Volts

VII	KADAGATHUR Exge (KT) UG cables				
1	KT-KT1(Exge to Nagenahalli)				IV LESS THAN 430 V
2	KT-KT2(Exge to Teriyur)				
3	KT-KT3(Exge to Gundagal)				
4	KT-KT4(Exge to Santhebidanur Road)				

MAP 3 of 7

I	THUMUKUNTA Exge (TMK) UG cables				
1	TMK Exge - TMK Joint - DP 0001				IV LESS THAN 430 V
2	TMK Exge - TMK Joint - DP 0002				
3	TMK Exge - P21 - DP 2101				
4	TMK Exge-P 22- DP 2202				
5	TMK Exge - P 23 - DP 2301				
6	TMK Exge- P 24 - DP 2401				
II	MALUGURU Exge (MLG) UG cables				
1	MLG Exge to DP 0001				OUTSIDE IV CALCULATION CONSIDERATION ZONE
2	MLG Exge to DP 0002				
3	MLG Exge to DP 0003				
4	MLG Exge to MLG Joint- DP 0004				
III	BUDILI Exge (BDL) UG cables				
1	BDL Exge - DP 0001				IV LESS THAN 430 V
2	BDL Exge - DP 0006				
IV	GORANTLA Exge (GRN) UG cables				
1	GRN Exge - P 21				IV LESS THAN 430 V
2	GRN Exge - P 25 - DP 2501				
3	GRN Exge- P 27 - DP 2701				
4	GRN Exge - P 28 -DP 2801				
5	GRN Exge - P 29 - DP 2901				
6	GRN EXGE - P 31 - DP 3101				
V	CHALAKURU Exge (CHLK) UG cables				
1	CHLK Exge - DP 0001				OUTSIDE IV CALCULATION CONSIDERATION ZONE
2	CHLK Exge - DP 0005				
VI	PALASAMUDRAM Exge (PSM) UG cables				
1	PSM Exge to DP 0001				OUTSIDE IV CALCULATION CONSIDERATION ZONE
2	PSM Exge to DP 0006				
3	PSM Exge to DP 0005				
4	PSM Exge to DP 0004				
VII	PARIGI Exge (PRG) UG cables				
1	PRG Exge - P 21- DP 2101				OUTSIDE IV CALCULATION CONSIDERATION ZONE
2	PRG Exge - P 21 A - DP 21A01				
3	PRG Exge - P 22- P 23- DP 2301				OUTSIDE IV CALCULATION CONSIDERATION ZONE
4	PRG Exge-P 23 - DP 2302				
5	PRG Exge /DP 0001				

ANNEXURE - I

Case No.: AND-676		Map Scale : 1 cm = 500 m			
Name of the Power Line : 400 kV D/C Kadapa - Madhugiri Transmission Line		Length of Line : 238.400 km		Avg S.R. Value : 25,000 Ohm-cm	
Sl. no.	Name of Telecom Line	Length of Parallelism in KMs	Mutual Coupling in Ohms	Fault Current in Amps	Induced Voltage in Volts

MAP 4 of 7 (NO TELECOM DETAILS)

MAP 5 of 7

KADIRI MBM Exge UG cables					
1	MBM Exge - P 51	IV LESS THAN 430 V			
2	MBM Exge - P 52				
3	MBM Exge - P 53				
4	MBM Exge - P 54				
5	MBM Exge - P 55				
6	MBM Exge - P 56				
7	MBM Exge - P 57				
8	MBM Exge - P 58 - P 59				
9	MBM Exge - P 61				
10	MBM Exge - P 62				
11	MBM Exge - P 63				
12	MBM Exge - P 64				
13	MBM Exge - P 65				
14	MBM Exge - P 66				
15	MBM Exge - P 71				
16	MBM Exge - P 72				
17	MBM Exge - P 73				
KADIRI RSU Exge UG cables					
1	RSU Exge - P 21	IV LESS THAN 430 V			
2	RSU Exge - P 22				
3	RSU Exge - P 23				
4	RSU Exge - P 24				
5	RSU Exge - P 25				
6	RSU Exge - P 26				
7	RSU Exge - P 27				
8	RSU Exge - P 28				
9	RSU Exge - P 31				
10	RSU Exge - P 32				
11	RSU Exge - P 33				
12	RSU Exge - P 34				
13	RSU Exge - P 35				
14	RSU Exge - P 36				
15	RSU Exge - P 41				
16	RSU Exge - P 42				
17	RSU Exge - P 43				
18	RSU Exge - P 44				
19	RSU Exge - P 45				

ANNEXURE - I

Case No.: AND-676					
Name of the Power Line : <u>400 kV D/C Kadapa – Madhugiri Transmission Line</u>		Map Scale : 1 cm = 500 m			
		Length of Line : 238,400 km			
		Avg S.R. Value : 25,000 Ohm-cm			
Sl. no.	Name of Telecom Line	Length of Parallelism in KMs	Mutual Coupling in Ohms	Fault Current in Amps	Induced Voltage in Volts

MAP 6 of 7

VEMPALLI Exge UG cables					
1	Vempalli Exge - Police station P21 - DP 2101				
2	Vempalli Exge - Market P24 - DP 2401				
3	Vempalli Exge - ZP High School P 25 - DP 2501				
4	Vempalli Exge - Vrushabhachala P 27 - DP 2702				
5	Vempalli Exge - Nagulakunta P 30 - DP 3001				
6	Vempalli Exge - Sivalayam P 31 - DP 3101				
7	Vempalli Exge - Garugu street P 32 - DP 3201				
8	Vempalli Exge - Kata Street P 33 - DP 3301				
9	Vempalli Exge - 4 Roads P 22 - DP 2201				
10	Vempalli Exge - Raghavendra School P 23 -DP 2301				
11	Vempalli Exge - Bodduchavidi P 26 - DP 2601				
12	Vempalli Exge - YSR Guest House P 28 - DP 2801				
13	Vempalli Exge - Pulivendula Road P 40 - DP 4002				

IV LESS THAN 430 V

MAP 7 of 7

I NANDIMANDALAM Exge UG cables					
1	Exge - P 20 - DP 2001				
2	Exge - P 30 - DP 3001				
3	Exge - DP 0001				
II YELLATUR Exge UG cables					
1	Exge - DP 0001				
2	Exge - DP 0010				
III YUV Exge UG Cables					
1	Exge - DP 0001				
2	Exge - DP 0010				
3	Exge • DP 0020				
IV C.K. DINNE Exge UG Cables					
1	Exge - P 21 - DP 2101				
2	Exge - P 31- DP 3101				
3	Exge - P 41 - DP 4101				
V Power Grid (KADAPA) Exge UG Cables					
1	Exge - DP 0001				

IV LESS THAN 430 V

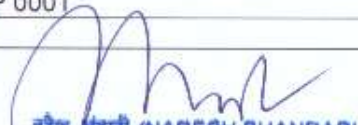
IV LESS THAN 430 V

OUT OF PARALLELISM

IV LESS THAN 430 V

IV LESS THAN 430 V

IV LESS THAN 430 V


 नरेश भंडारी / NARESH BHANDARI
 मुख्य अभियंता / Chief Engineer
 केन्द्रीय विद्युत प्राधिकरण / C.E.A.
 विद्युत मंत्रालय / Ministry of Power
 भारत सरकार / Govt. of India
 नई दिल्ली / New Delhi-66

ANNEXURE - II

Case No.: AND-676					
Name of the Power Line : 400 kV D/C Kadapa – Madhugiri Transmission Line		Map Scale : 1 cm = 500 m			
		Length of Line : 238.400 km			
		Avg S.R. Value : 25,000 Ohm-cm			
Sl. no.	Name of Telecom Line	Length of Parallelism in KMs	Mutual Coupling in Ohms	Fault Current in Amps	Induced Voltage in Volts

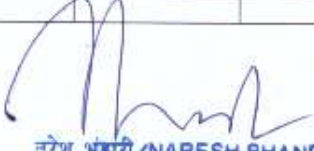
SOUTH CENTRAL RAILWAY					
Ref. No: SG.85/4/3/PTCC/SCRAP201835 RTD			DATED: 17.09.2018		
Affected Blocks & Telecom Circuits Details					
1	Kalagamudram(KCM)-Kadiri(KRY)	OUT OF PARALLELISM			0
2	Kadiri(KRY)-Nallacheruvu(NCU)	3.2	0.0064	10000	64
3	Nallacheruvu(NCU)-Tanakallu(TKU)	OUTSIDE IV CALCULATION			0
4	Gangayapalli(GPY)-Krishnapuram(KPU)	CONSIDERATION ZONE			0
5	Krishnapuram(KPU)-Kadapa(HX)	2.4	0.0012	11200	14
6	Kadapa(HX)-Kanamalopalle(KNLP)	0.3	0.0001	11000	1
7	Kadapa(HX)-Pendlimarri	19.5	0.0168	9800	165
8	Pendlimarri-Nandimandalam	10.5	0.0086	9600	83
9	Nandimandalam -Kuppaguttapalle	6.7	0.0094	9000	85


 नरेश भंडारी / NARESH BHANDARI
 मुख्य अभियंता / Chief Engineer
 केन्द्रीय विद्युत प्राधिकरण / C.E.A.
 विद्युत मंत्रालय / Ministry of Power
 भारत सरकार / Govt. of India
 नई दिल्ली / New Delhi-66

ANNEXURE – III

Case No.: AND-676					
Name of the Power Line : 400 kV D/C Kadapa – Madhugiri Transmission Line		Map Scale : 1 cm = 500 m Length of Line : 238.400 km Avg S.R. Value : 25,000 Ohm-cm			
Sl. no.	Name of Telecom Line	Length of Parallelism in KMs	Mutual Coupling in Ohms	Fault Current in Amps	Induced Voltage in Volts

SOUTH WESTERN RAILWAY					
Ref. No: SG/SWR/PTCC/KDP-MDG/1789/14			DATED: 10.10.2018		
Affected Blocks & Telecom Circuits Details					
		OUTSIDE IV CALCULATION			0
		CONSIDERATION ZONE			0
1	Someshwara (SMWA) – Gauribidanur (GBD)				
2	Gauribidanur (GBD) – Viduraswattha (VWA)				
3	Viduraswattha (VWA) – Devarapalle (DPE)	0.55	0.0008	10000	8
4	Devarapalle (DPE) – Hindupur (HUP)	3.6	0.0032	10000	32
5	Hindupur (HUP) – Malugur (MLU)	5.1	0.0008	10000	12


 नरेश भंडारी/NARESH BHANDARI
 मुख्य अभियन्ता/Chief Engineer
 केन्द्रीय विद्युत प्राधिकरण/C.E.A.
 विद्युत मंत्रालय/Ministry of Power
 भारत सरकार/Govt. of India
 नई दिल्ली/New Delhi-66