



सत्यमेव जयते

**भारत सरकार**  
**Government of India**  
**विद्युत मंत्रालय**  
**Ministry of Power**  
**केन्द्रीय विद्युत प्राधिकरण**  
**Central Electricity Authority**  
**विद्युत प्रणाली संचार विकास प्रभाग**  
**Power System Communication Development Division**

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<b>CEA Case No. : MRA-1188</b>		
<b>Induced Voltage (IV) calculation for PTCC proposal of <math>\pm 320</math> kV HVDC transmission line from AEMIL Kudus to AEMIL Aarey (Length: 30 km O/H + 50 km UG) – regd.</b>		
<b>S. No</b>	<b>Reference No.</b>	<b>Dated</b>
(i)	AEMIL/HVDC/Cable/SPP/21-22/12	09.11.2021
(ii)	AEMIL E-mail:	15.04.2024
(iii)	AEMIL E-mail:	17.07.2024
(iv)	BSNL: IC/MBI/PTCC/MRA-2528/03	12.07.2023
(v)	Central Railway: N.153/PTCC/320kV/MAH-793	26.11.2021
(vi)	Western Railway: SG.158/28/09 (322) (received vide AEMIL e-mail dated 15.04.2024)	17.03.2022
(vii)	Defense: B/46937/Sigs 7(b)/2650	10.01.2022

The PTCC proposal submitted vide reference (i), (ii) and (iii) have been examined. The LF induction on communication circuits of BSNL, Central Railway and Western Railway with respect to details furnished vide above references (iv), (v) and (vi) respectively have been computed. The voltage likely to be induced on paralleling communication cables of BSNL, Central Railway and Western Railway under Single Line to Ground fault condition are enclosed at Annexure-I, Annexure-II and Annexure-III respectively. The screening factors as applicable have been considered. DG Signals, MoD have issued No Objection Certificate (NOC) vide reference (v) (enclosed as Annexure-I).

EPR Zones for proposed substations are mentioned below.

Name of the proposed SS	Half Diagonal Distance, D/2 (mts)	Fault Current, I (kA)	Resistance of earthmat, R (Ohms)	d (mts) at 430 V	d (mts) at 650 V	d (mts) at 7 kV	d (mts) at 10 kV
$\pm 320$ kV Kudus HVDC station (AEMIL)	150	11	0.1407	390	207	NA	NA
$\pm 320$ kV Aarey HVDC station (AEMIL)	105.96	20.1	0.076	270	143	NA	NA

As per the details submitted by BSNL vide reference (iv) above, no telephone exchange is falling in the EPR zone of the proposed substations.

Taking the above into consideration, necessary action for issuance of PTCC route approval may be taken under intimation to this office.

**Chief Engineer**

**To,**

1.	Divisional Engineer (PTCC), Western Zone	QA & Inspection circle, 1 <sup>st</sup> floor, D- wing, BSNL Admin Bldg., Junu Tara Road, Santacruz (West), Mumbai-400054	
2.	GM (S&T) , Central Railway	3 <sup>rd</sup> floor, Annex Building, CSMT, Mumbai – 400 001	
3.	GM (S&T), Western Railway	Office of PCSTE, S&T Dept., 5 <sup>th</sup> floor, Station building, Churchgate, Mumbai – 400 020	
4.	M/s Adani Electricity Mumbai Infra Ltd.	Adani Corporate House, Shantigram, SG Highway, Ahmedabad – 382 421	Copy for information

**ANNEXURE-I**

CEA Case No.: MRA-1188 Name of the Power line: $\pm 320$ kV HVDC transmission line from AEMIL Kudus to AEML Aarey		Map Scale : 1 cm= 500 m Total Length : 30 km O/H + 50 km UG S.R. Value : 10,000 Ohm-cm (for O/H portion 5,000 ohm-cm (for U/G portion)			
S.No.	Telecom. Details	Length of Parallelism in Km.	Mutual Coupling in Ohms.	Effective Fault current in Amps.	I.V in Volts.
<b>BSNL Letter No BSNL: IC/MBI/PTCC/MRA-2528/03 Date: 12.07.2023</b>					
1.	Neminath TE to A			IV less than 430 V	
2.	Neminath TE to B			IV less than 430 V	
3.	Neminath TE to C			IV less than 430 V	
4.	Gokhiware TE to A			IV less than 430 V	
5.	Gokhiware TE to B			IV less than 430 V	
6.	Gauraipada TE to A			IV less than 430 V	
7.	Gauraipada TE to B			IV less than 430 V	
8.	Sativali TE to A			IV less than 430 V	
9.	Sativali TE to B	1.8	0.00715	11189	80
10.	Kudus TE to A	0.8	0.04549	10794	491
11.	Kudus TE to B			Out of parallelism	
12.	Ambadi TE to A			IV less than 430 V	
13.	Ambadi TE to B			IV less than 430 V	
14.	Ambadi TE to C			IV less than 430 V	
15.	Vadoli TE to A			Out of parallelism	
16.	Vadoli TE to B			IV less than 430 V	
17.	Vadoli TE to C (Ganeshpuri)			IV less than 430 V	
18.	All cables of Andheri			IV less than 430 V	
19.	All cables of Jogeshwari			IV less than 430 V	
20.	All cables of Versova			Out of IV consideration zone	

21.	All cables of BKC	Out of parallelism			
22.	All cables of KHR	Out of parallelism			
23.	All cables of ATC RSU	Out of parallelism			
24.	All cables of DARPAN	Out of parallelism			
25.	All cables of Marol	Out of parallelism			
26.	All cables of Sakinaka	Out of parallelism			
27.	All cables of Sakivihar	Out of parallelism			
28.	All cables of Seepz	IV less than 430 V			
29.	All cables of Technopolis	IV less than 430 V			
30.	All cables of Wilson RSU	IV less than 430 V			
31.	All cables of Vakola/ WTR	Out of parallelism			
32.	All cables of Vile Parle	Out of parallelism			
33.	All cables of Borivali	IV less than 430 V			
34.	All cables of Charkop	IV less than 430 V			
35.	All cables of Shimpoli	IV less than 430 V			
36.	All cables of Bhayandar	Out of IV consideration zone			
37.	All cables of DSR	IV less than 430 V			
38.	All cables of Golden Nest	IV less than 430 V			
39.	All cables of Kashmirira	IV less than 430 V			
40.	All cables of Mira Road	IV less than 430 V			
41.	All cables of Gokuldham	1.3	0.00859	37136	319
42.	All cables of Goregaon	IV less than 430 V			
43.	All cables of Pahadi	IV less than 430 V			
44.	All cables of Akurli	IV less than 430 V			
45.	All cables of Magathane	IV less than 430 V			
46.	All cables of Malad	IV less than 430 V			
47.	All cables of Samtanagar	IV less than 430 V			
48.	All cables of Kandivali	IV less than 430 V			
49.	All cables of Hingwala RSU	Out of parallelism			
50.	All cables of Garodia Nagar RSU	Out of parallelism			
51.	All cables of GKP Exch.	Out of parallelism			
52.	All cables of Deep Plaza RDLU, KRL	Out of parallelism			
53.	All cables of GOD Hill RSU	Out of parallelism			
54.	All cables of NNGR	Out of parallelism			

55.	All cables of Powai Main	Out of parallelism
56.	All cables of CETTM RSU (Hiranandani)	Out of parallelism
57.	All cables of IITC RSU (Powai)	Out of parallelism
58.	All cables of Kannamwar RSU	Out of parallelism

**ANNEXURE-II**

<b>CEA Case No.: MRA-1188</b> <b>Name of the Power line:</b> $\pm 320$ kV HVDC transmission line from AEMIL Kudus to AEML Aarey			<b>Map Scale</b> : 1 cm= 500 m <b>Total Length</b> : 30 km O/H + 50 km UG <b>S.R. Value</b> : 10,000 Ohm-cm (for O/H portion) 5,000 ohm-cm (for U/G portion)		
S.No.	Telecom. Details	Length of Parallelism in Km.	Mutual Coupling in Ohms.	Effective Fault current in Amps.	I.V in Volts.
<b>Central Railway: N.153/PTCC/320kV/MAH-793 Date: 26.11.2023</b>					
1	Matunga to Mulund	0.8	0.0000011	19842	~0
2	Guru Tegh Bahadur Nagar to Vashi	Out of parallelism			
3	Kurla to Trombay	Out of parallelism			
4	Vasai Road to Kharbhav	5.1	0.00069	11595	8

**ANNEXURE-III**

CEA Case No.: MRA-1188 Name of the Power line: $\pm 320$ kV HVDC transmission line from AEMIL Kudus to AEML Aarey		Map Scale : 1 cm= 500 m Total Length : 30 km O/H + 50 km UG S.R. Value : 10,000 Ohm-cm (for O/H portion 5,000 ohm-cm (for U/G portion)			
S.No.	Telecom. Details	Length of Parallelis m in Km.	Mutual Coupling in Ohms.	Effective Fault current in Amps.	I.V in Volts.
<b>Western Railway: SG.158/28/09 (322) Date: 17.03.2022</b>					
1.	Bandra to Khar Road	Out of parallelism			
2.	Khar Road to Santa Cruz	Out of parallelism			
3.	Santa Cruz to Ville Parle	Out of parallelism			
4.	Ville Parle to Andheri	Out of parallelism			
5.	Andheri to Jogeshwari	Out of parallelism			
6.	Jogeshwari to Ram Mandir	1.3	0.0000463	21598	1
7.	Ram Mandir to Goregaon	Out of parallelism			
8.	Goregaon to Malad	1.5	0.000357	19608	7
9.	Malad to Kandivali	1.1	0.000283	17668	5
10.	Kandivali to Borivali	2.5	0.000475	18947	9
11.	Borivali to Dahisar	1.4	0.000627	17544	11
12.	Dahisar to Mira Road	1.5	0.000287	17440	5
13.	Mira Road to Bhayander	2.8	0.000183	16387	3
14.	Bhayander to Naigaon	0.9	0.000018	16241	~ 0
15.	Naigaon to Vasai Road	3.4	0.000139	14324	2
16.	Vasai Road to Nallasopara	2.1	0.000257	11673	3
17.	Nallasopara to Virar	Out of parallelism			
18.	Virar to Vaitarna	4.1	0.000024	13421	~ 0
19.	Vaitarna to Saphale	Out of parallelism			