



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

CEA Case No. : UP-534		
Induced Voltage (IV) calculation for PTCC approval for LILO of 400 kV Varanasi-Bihar Sharif Transmission Line on D/C and M/C Tower at 400 kV Sahupuri S/s [Length for Ckt-I- 26.213 km and for Ckt-II- 25.549 km]-Regd.		
S. No	Reference No.	Dated
(i)	UPPTCL: 872/ETD-S/	22.06.2021
(ii)	UPPTCL: e-Mail	09.01.2024
(iii)	CEA Letter No: CEA-PS-17-11(11)/3/2024-PCD Division/ I/32960/2024	10.01.2024
(iv)	UPPTCL Letter No. 133/ETD(S)/	12.02.2024
(v)	BSNL: DET/PTCC/ND/DV-10175/UP-1111/2022-23/	18.03.2023
(vi)	Northern Central Railway: एनसीआर/एस एंडटी/2074/टेलीकॉम/पीटीसीसी(पार्ट-1)	30.01.2023
(vii)	Defense: B/46937/Sigs7(b)/2456	19.07.2021

The PTCC proposal submitted vide reference (i) & (ii) has been examined. Induced Voltage calculation for subject cited Transmission Line was issued vide reference (iii). Later, vide reference (iv) UPPTCL has stated that earlier submitted Soil Resistivity values were measured by faulty meter and inaccurate values of soil resistivity was submitted vide e-mail dated 09.01.2024. Further, Transmission Utility has again rechecked for Soil Resistivity and this time values are much lesser than earlier submitted data. As significant deviation was observed in both the values, a joint visit to verify soil resistivity with representatives from CEA, BSNL, North Central Railway and UPPTCL was done on 01.03.2024 and its report is enclosed at Annexure-II.

The LF induction on Block and Telecom circuits of North Central Railway with respect to details furnished vide above reference (vi), has been computed. The voltage likely to be induced on paralleling Block and Telecom circuits of North Central Railway under Single Line to Ground fault condition are enclosed at Annexure-I. The screening factors as applicable have been considered. DET, BSNL-North Zone and DG Signals, MoD has issued No Objection Certificate (NOC) vide reference (v) & (vii) respectively.

Taking above into consideration, necessary action regarding issuance of PTCC approval for the subject cited transmission line might be taken under intimation to this office.

Encl.: As above

Chief Engineer

File No.CEA-PS-17-11(11)/3/2024-PCD Division**To,**

1.	Divisional Engineer (PTCC), Northern Zone	BSNL, O/o PGM(North), QA & Inspection Circle D-Tax Building, Eastern Court, Janpath New Delhi-110001	
2.	GM (S&T)	North Central Railway Ganga Parisar, Prayagraj	
3.	Executive Engineer UPPTCL	ETD-III Sahupuri, Varanasi	Copy for information.

ANNEXURE-I

CEA Case No.: UP-534			Map Scale : 1 cm= 500 m		
Name of the Power line: LILO of 400 kV Varanasi-Bihar Sharif Transmission Line on D/C and M/C Tower at 400 kV Sahupuri S/s.			S.R. Value : 2000 Ohm-cm		
S.No.	Telecom. Details	Length of Parallelism in Km.	Mutual Coupling in Ohms.	Effective Fault current in Amps.	I.V in Volts.
Northern Central Railway Letter No: एनसीआर/एस एंड टी/2074/टेलीकॉम/पीटीसीसी(पार्ट-1) Dated 30.01.2023					
<u>Affected Blocks & Telecom Circuits Details</u>					
<u>Circuit-I for LILO Arrangement [Length- 77.309 km]</u>					
1	Kailihat R/s to DDU R/s	5.50	0.001	25400	25
<u>Circuit-II for LILO Arrangement [Length- 82.834 km]</u>					
1	Kailihat R/s to DDU R/s	11.50	0.0014	24600	34

JOINT VERIFICATION REPORT

- Vide letter dated 22.02.2024, CEA (Power System Communication Development Division), has issued directions to carry out joint verification of the Soil Resistivity data of LILO of 400 kV Varanasi-Biharsharif Transmission Line at 400 kV Shahupuri S/s.
- Accordingly, following members has visited the field for verification of Soil Resistivity date on 01.03.2024.
 - Sh. Arjun Agarwal, Assistant Director, CEA, New Delhi.
 - Sh. Jitender Kumar Katiyar, SDE North Zone, BSNL, New Delhi
 - Sh. Ajayb Lal, SSE Mirzapur, North Central Railway Prayagraj.
 - Sh. R.K. Upadhayay, EE ETD-III, Varanasi, UPPTCL.
- The soil resistivity was measured by 04 electrode method using a Digital Earth Resistance Meter, Make- Sonel, Sr. No. CM1547- (Copy of calibration certificate is enclosed) at Nos. location and details of are mentioned below: -

Sr. No.	Loc. No.	Soil Resistivity Resistance (ohm-m)	Soil Resistivity (Ohm-M) $\rho=2\pi RL$ (Where L=50 M)	Remarks
01	22 (Multi CKT)	12.1	3802	Arjun
02	29 (CKT-1)	14.4	4525	

Note:- Value of Soil Resistivity at Loc No 22 & 29 is 12.1 & 14.3 Ω -m respectively as per the measurement done at site. Photographs of Meggar readings enclosed.

Enclosures: -

- Calibration Certificate
- Photograph of the Megger reading.

Arjun
01/03/2024
Arjun Agarwal
Assistant Director
CEA, New Delhi

Jitender Kumar Katiyar
01/03/24
S.D.E.
BSNL, New Delhi

Ajayb Lal
01/03/24
S.S.E. Mirzapur
N.C.R. Prayagraj
SSE/T/M&P

R.K. Upadhayay
01/03/24
EE ETD-III, Varanasi
UPPTCL



ASIAN TECHNOLOGY

(A HOUSE OF CALIBRATION)



Customer name And Address	M/S: Electricity Transmission Division - III UP Power transmission corporation pvt ltd Sahupuri Varanasi, Uttar Pradesh	Service request No. & date	P/01/02/03/24&22/02/2024
		ULR no.	CC22392400000
		Cert. No.	AT/24000001527
		Date of Receipt of DUC	22/02/2024
		Date of calibration	22/02/2024
		Date of issue	22/02/2024
		Suggested due date	21/02/2025

Instrument Details

Instrument name	Soil Resivity Machine	Location	---
Make	Sonel MRU-30	Accuracy	---
Range / Size	999k Ω m	Visual Inspection	OK
Least Count	0,00 Ω m	Calibration Performed at	Site
I.D. No. / Sr. no.	CM1547		

Detail of reference standards & Major equipment's used

Equipment Name	Power meter			
Make	Altrox			
Model / SR No.	-----			
Certificate No.	TYCON/WB/12/2023/1184			
Calibration Validity	24/12/2025			
Calibration by	Excellent service			
Environmental Condition	Temperature	(23 \pm 3) $^{\circ}$ C	Calibration Reference	IS:878 (2008)
	Relative Humidity	(50 \pm 20) %	Work Instruction	AT/WI-15M

Calibration Result

Serial No.	Pin spacing meters	Pin spacing feet	Soil resitivity (ohm-cm)				
			Set A	Set B	Set C	Set D	
01.	0.76	2.5	960	1100	3300	760	±7.02
02.	1.5	5	965	1000	2200	810	
03.	2.3	7.5	950	1250	1150	1900	
04.	3.0	10	955	1500	980	3800	
05.	3.8	12.5	960	1610	840	6900	
06.	4.6	15	955	1710	780	12500	

Remarks: Unit under calibration

- ❖ (1) Standard equipment use for calibration are traceable to national/ international standards.
- ❖ (2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor $k = 2$ such that the coverage probability corresponds to approximately 95%. (3) The above results are valid at the time of and under the stated conditions measurement. (4) This certificate is refers only to the particular item submitted for calibration. (5) Next calibration due date given as requested by the customer.

Calibrated By
(Calibration Engg./TM)
(Dibraj)
Form No. QF-47

Approved By
(QM/TM)
(NEERAJ YAGHI)
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--End Of Report--







