

## CHAPTER II

### ROLE OF PTCC AND PTCC CLEARANCES

2.1 Power and Telecommunication Co-ordination Committee (PTCC) is a central standing committee for co-ordination of Power and Telecommunication system. The committee was formed by the Government of India in the year 1949. The role of the committee is to deal with route approval for all new power lines (As per the proforma given in the PTCC Manual – 1995 edition, page 36). The clearance of this committee is required before energization of new power lines of 11KV and above, which is given after obtaining clearances from the Railway/Telecom having lines in the area.

2.2 Various committees connected with Power and Telecommunication Co-ordination:

i) Central Standing Committee: This consists of two representatives from DOT and two from Central Electricity Authority (CEA). This was set up by the high level committee to look into estimates, which have resulted in delay in settling re-engineering cases.

ii) High Level Committee: This is a committee at the level of secretaries or Chairman/Members of the Board from Power and Telecommunication sectors. The committee is assisted by officers from the two sides. Cases where no consensus could be arrived at the level of the central PTCC are referred to this committee. Officers from the Railways are invited when there are issues involving them.

iii) Central PTCC: This consists of members from the CEA, DOT, Railways and the Army. The composition of the committee as formulated in 1982 is given in Annexure 'A'. The meetings of the committee are to be held once in three months generally.

iv) State Level PTCC: This is similar to the central PTCC with representatives from the station/region. The composition of the committee as formulated in 1985 is given in Annexure 'B'. The committee is to meet once in a month generally but not later than once in 3 months.

2.3 i) Central PTCC deals with cases of energization of power lines of 220KV and above.

ii) Cases of energization of power lines up to 132KV DC are processed at the state level. However, for cases of 33KV DC and above up to 132 KV DC, final PTCC clearance is to be given by DET(PTCC).

For cases of above 11KV up to 33KV S/C clearance is given by State Level PTCC.

For power lines of 11KV, clearance is given by DET of the Telecom Department.

2.4 Copies of route map of the proposed electrical lines are to be submitted to the GM(S&T) of the concerned railways in 4 copies. The route map should depict all topographical details including railway lines, rivers, canals and important roads and other land marks like towns, villages with names etc., on either side of the

proposed power line. Topographical maps of the Survey of India are used for this purpose. The distances over which the details are to be marked, are as under:

Power lines of 66KV and above = 8Kms on either side.

Power lines of above 11KV and up to 33 KV = 5 Kms on either side.

Power line of 11 KV = 3 Kms on either side.

- 2.5 On receipt of the route maps, Railways shall check whether the proposed power line falls within the jurisdiction of the zonal railway. If it does not fall within the zonal railways jurisdiction, the proposal shall be returned back to the PTCC without any delay and the railway to which it should be sent shall also be advised. The railway concerned on receipt the proposal shall mark their telecom lines on the maps and submit two copies to the PTCC. The details in full of all the circuits working on the telecom alignments giving the discontinuity points and route length should be furnished.
- 2.6 Induced voltage calculations are calculated by the following:
- i) Up to 11KV lines = local DET of the telecom department.
  - ii) Above 11KV and up to 33 KV lines – by SDE/PTCC.
  - iii) Above 33 KV DC and above – by DET/PTCC.
- 2.7 Safe limit for induction due to LF induction due to short circuit fault is 430V and is generally the ruling factor. In specific cases, longitudinal induced voltages under normal conditions are to be examined. In case, where the induced voltages due to short circuit fault on the telecom circuits, exceeds prescribed safe limit of 430V, it is necessary to consider various protection measures, so that the equipment installed and the personal working on these circuits are not subjected to the influence of hazardous potentials.

One of the measures, commonly adopted for protection is the use of three electrode Gas Discharge (GD) tube. Two electrodes of the tube are connected to the wires of a telephone pair and the third electrode to the earth, through a earth cap. Under normal conditions, the telecom line is kept insulated. The gap breaks down and the telecom line is virtually earthed, when induced voltage exceeds the pre-determined value (250V). Through the discharge path the earth connection to the tube should be of very low resistance, so that the voltage across the tube is restricted to safer values.

- 2.8 Protective measures against induced voltages in excess of the safe limits on different types of block instruments in use in Indian Railways is given in Appendix XVII – Chapter I of PTCC manual – edition 1995. The limits for the block instruments presently in use on IR are given below:
- a) Neale's Token instrument and Neale's tablet instruments with the characteristics similar to Neale's token in respect of 3-position relay and lock magnet and Neale's 'D' type.
    - i) For induced voltage not exceeding 430V no special precaution is necessary.
    - ii) For induced voltages exceeding 430V metallic return and appropriate Gas Discharge tubes are to be provided.
  - b) SGE Double Line Block Instrument: As at 'a' above.

- c) Diado Single Line Tokenless Block Instruments:  
Without modification this instrument can safely stand induction up to 74V 50 cycles AC induced voltages. For induced voltages up to 650V AC the following modification is to be made:  
3-position polarized relay of the type used in Neale's token or SG double line block instrument is to be interposed in the line circuit and the existing line relay (N.R.Relay) fed from local battery through the contacts of polarized relay. Also the line condensers C1 & C2 each of the microfarad capacity with a voltage rating of 160V are to be replaced by condensers of equal capacitance but with a voltage rating of 1000V. Standard gas dischargers will also have to be provided for the lines.
- d) Podanur make Single Line Tokenless Block Instrument (Push Button Type)  
This instrument is only suitable for use in non AC electrified sections. This instrument is safe for use of block circuits subjected to maximum induction 650Vr.m.s. 50 cycles AC from neighboring power line provided the existing DC blocking condenser in the telephone circuits is replaced by a one rated for 1000V DC for non AC section only (non AC electrified).
- e) Maximum acceptable limit of induced voltage due to power parallelism is up to 2000V on railway block and communication circuits subject to the specific limitations mentioned above.

The cases of induced voltages above these limits should be treated as re-engineering cases and each such case should be treated separately in consultation with the Railway Board.

- 2.9 Railway control and other overhead circuits to be invariably provided with GD tubes on par with the protective arrangements required for protection of block circuits.
- 2.10 Interference to signaling circuits shall be checked up with reference to the A.C. immunity of the signaling equipment viz., track circuit relays, line relays, point machines etc. Interference voltages to signaling circuits are not provided by PTCC and will have to be done by the Railways in specific cases where interference is suspected.
- 2.11. After calculation of induced voltages, divisions shall be advised of the protective measures to be taken and final clearances for energization of power lines shall be given only after provision of protective measures is completed wherever necessary.
- 2.12 Divisions shall ensure that protective measures are maintained properly. During inspections, the availability of the protective measures at the stations shall be checked.
- 2.13. The expenditure for provision of the protective measures shall be deposited by the agency which carries out erection of the new power lines.
- 2.14. Code of practice for the protection of telecommunication lines at crossings with overhead power lines other than electric traction circuits is contained in chapter VI of the PTCC manual and is to be followed in all cases of new power lines crossing the overhead alignments in use on Railways, either on lease from BSNL or Railways own.

Guarding arrangements shall be provided for crossings of up to 36KV and the detailed drawings for separations to be followed as per the code of practice shall be followed.

The minimum clearances between the extra high voltage lines (above 36 KV) and telecommunication wires as per the above code of practice shall be:

For lines of voltage above:

36 KV up to and including 72.5 KV = 2440 mm(8'0")

For lines of voltages above 72.5 KV up to and including 145 KV = 2740 mm(9'0")

For lines of voltage above 145 KV up to and including 245 KV = 3050 mm(10'0")

For lines of voltage above 245 KV = 3050 mm (10'0")  
Plus 305mm (1foot) for every additional 33 KV or part thereof.

- 2.15. Method for carrying out low frequency induction test if required, and code of practice for protection from earth potential rise (EPR) are described in the PTCC manual. It should be ensured that the EPR at locations of telephone exchanges, cable joints, terminals, pillars, cabinets etc., is within safe limits. The EPR counters which define hazard zone for telephone plants are given below:

S.No.	Type of Telecom Plant	Type of Power System	
		High Reliability Lines	Other Lines
1.	Terminal apparatus, joints, cabinets, pillars, manholes, pits, poles	650 V	430 V
2.	Telephone Exchanges	430 V	430 V
3.	Cables: a) Metal Sheathed b) Plastic insulated and plastic sheathed.	650 V 7 KV	430 V 7 KV

- 2.16. Just as clearances from the departments of Telecommunication and Ministry of Railways are required in cases of new power lines, induction effects due to existing power lines shall be evaluated before erection of new overhead alignments for telecommunications. However, erection of new overhead alignments for telecommunication is no longer followed by Department of telecommunication or by the Ministry of Railways or Ministry of Defense.
- 2.17. PTCC Monitoring cell headed by CCE/DyCSTE(Tele) of the railway shall monitor the timely disposal of pending and new cases. The cell shall maintain the concern data on PC with the help of nominated official/supervisor.

- 2.18. Further details are available in PTCC Manual published by Power & Telecommunication Co-ordination Committee. The information is available on [www.tnd.bsnl.co.in/ptcc/ptcc.htm](http://www.tnd.bsnl.co.in/ptcc/ptcc.htm).
- 2.19. Further information on this subject is available in ITU-T: Directives concerning the protection of telecommunication lines against harmful effects from electric power and electrified railway lines, *ITU*, Geneva, 1990.

## *Annexure - 'A'*

### COMPOSITION OF THE COMMITTEE AT CENTRAL LEVEL:

- |       |  |   |                                      |
|-------|--|---|--------------------------------------|
| i)    | Chief Engineer(LD&T),<br>Central Electricity Authority<br>New Delhi  | - | To be chairman in<br>alternate years |
| ii)   | Chief General Manager, T&D Circle<br>Department of Telecom, Jabalpur | - | To be chairman in<br>alternate years |
| iii)  | Director(PTCC),<br>Central Electricity Authority, New Delhi          | - | Secretary(PTCC)<br>C.E.A             |
| iv)   | Director/Telecom, Railway Board                                      | - | Member                               |
| v)    | Director (GP), Telecom Directorate                                   | - | Member                               |
| vi)   | Director (ML), Telecom Directorate                                   | - | Member                               |
| vii)  | TEC, Department of Telecom   | - | Member                               |
| viii) | Chief General Manager's of BSNL<br>of respective circle              | - | Member                               |
| ix)   | DDG(T), Director/Signals<br>Army Headquarters                        | - | Member                               |

## ***Annexure - 'B'***

### COMPOSITION OF THE COMMITTEE AT STATE LEVEL:

- |    |  |   |           |
|----|--|---|-----------|
| 1) | Deputy General Manager of Telecom Circle/Superintending Engineer of Electricity Board (in alternate years) | - | Chairman  |
| 2) | Asst. Engineer (PTCC) of T&D Circle  | - | Secretary |

#### **Communication Side:**

- |    |  |   |        |
|----|--|---|--------|
| 3) | AGM/Planning in-charge of PTCC   | - | Member |
| 4) | DET(PTCC) of the Region  | - | Member |
| 5) | DSTE of Zonal Railways   | - | Member |
| 6) | Army representative of the area DCSO/Colonel Signals of respective Commands  | - | Member |
| 7) | Officer dealing with PTCC matters from Metro & all major telephone districts and MTNL, preferably of DE rank                         | - | Member |
| 8) | Any other representative from DOT side as a special invitee as per requirement of the meeting such as Area Directors of big circles. | - | Member |

#### **Power Side:**

- |     |   |   |        |
|-----|---|---|--------|
| 9)  | Zonal SE/EE in charge of O&M  | - | Member |
| 10) | Representative of any other Power organization in the state such as NTPC, NHPC etc. | - | Member |

#### **State Government Representative:**

- |     |   |   |        |
|-----|---|---|--------|
| 11) | Chief Electrical Inspector of the state - or his nominated representative | - | Member |
|-----|---|---|--------|