



सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA

विद्युत मंत्रालय
MINISTRY OF POWER

केन्द्रीय विद्युत प्राधिकरण
CENTRAL ELECTRICITY AUTHORITY



PTCC Manual 2010



विद्युत एवं दूरसंचार समन्वय समिति (पीटीसीसी)

POWER AND TELECOMMUNICATION CO-ORDINATION COMMITTEE (PTCC)



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PTCC Manual

2010

विद्युत, दूरसंचार और सूचना प्रौद्योगिकी विभाग; 1 फरवरी 2010

POWER AND TELECOMMUNICATION CO-ORDINATION COMMITTEE (PTCC)



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CHAIRPERSON & EX-OFFICIO SECRETARY
TO THE GOVERNMENT OF INDIA
CENTRAL ELECTRICITY AUTHORITY
SEWA BHAWAN, R.K. PURAM
NEW DELHI-110066

MESSAGE

The electrical energy being clean and the most convenient form of energy, having preference over other forms of energy, is a vital input for the economic development of the country. Along with the development of the transmission network of power sector, the development of telecommunication network, railway network and communication work of Defense sector also plays a major role at every stage of development of a nation. In order to provide interference free, economical and quality services of power and telecommunication, Government of India constituted a Central Standing Committee namely Power & Telecommunication Co-ordination Committee (PTCC) for addressing the Inter-Sector Telecommunication interference related issues amongst Power, Telecommunication, Railway and Defense Communication.

PTCC had been in existence since last 60 years and played a vital role in resolving technical issues, evolving standards and ensuring safe co-existence among various Power and Telecom Operators. I am pleased to know that new Edition of PTCC Manual has been brought out by Central PTCC after due diligence, deliberations and consultation with all the stakeholders.

I hope that the revised version of PTCC Manual would serve a useful guideline for all the utilities and other stakeholders for expediting the PTCC clearances for power lines and telecommunication network.

July, 2010


(GURDIAL SINGH)



S.M. DHIMAN



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CENTRAL ELECTRICITY AUTHORITY
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Message from Member (GO&D), Central Electricity Authority

Recognizing the need for coordination amongst the electrical and communication systems a Power and Telecommunication Co-ordination Committee (PTCC) has been constituted by the Government of India comprising members from Power Utilities, Telecommunication, Railways and Defense. The objective of the Committee is to ensure the safety to telecommunication equipment and precious human lives of personnel working in the concerned organizations as also those working in the close vicinity of power transmission lines. The Committee has made significant contribution since its inception.

The aggregate length of 220 kV and above transmission lines in the Country was 1,92,535 circuit kilometers at the end of 10th Plan. The transmission system development during the 11th Plan envisages formation of the National Grid. Additional transmission lines likely to be added in the transmission network would be of the order of 95,000 and 1,80,000 circuit-kilometers during 11th and 12th Plan respectively for evacuation of power from new generating stations to the load centers. This would enable increase in inter-regional transmission capacity to 32,650 MW by the end of 11th Plan and 75,000 MW towards the end of 12th Plan. There would also be a huge expansion due to additional intra-transmission network, inter-alia, requires various clearances to the projects including PTCC. The Central PTCC has continued to play a vital role in facilitating accord of PTCC route approval for the expansion of networks of Power, Telecommunications, and Railways.

The PTCC have issued guidelines and manuals from time to time for preparation of proposals for clearance. The norms are periodically reviewed by the Committee to affect changes in line with the technological advancements and bringing safety standards at par international level. The present edition of the manual has been finalized in consultation with all stakeholders and taking into consideration the advancements since its last edition. The manual incorporates revised method for calculation of mutual coupling, code of practice for laying of underground cables in proximity with communication cables, simplified procedure for coordination of power lines with telecommunication cables and guidelines for processing PTCC cases.

The PTCC Manual edition, 2010 would serve as a useful reference for framing proposals and enable expeditious clearance to infrastructure development projects in the field of Power, Telecommunication and Railways which contribute significantly to economic growth of the Country.

(S.M. DHIMAN)
Member (GO&D)
CEA

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गोपाल दास

अध्यक्ष एवं प्रबंध निदेशक

Gopal Das

Chairman & Managing Director



MESSAGE

I am pleased to note that the innovative edition of PTCC MANUAL 2010 is ready for release. There have been significant changes in PTCC activities over the years and a genuine requirement of a revised PTCC manual tailored to today's needs was felt essential, which, I am sure, is getting fulfilled by this edition.

The past few years have witnessed a vast boom not only in new Telecom installations but also in the Power and Railway sectors including the advent of metro operations in North and thus the role and importance of PTCC has enhanced manifold in settling disputes and cases requiring protection issues. I am also delighted to notice that the waiting period for PTCC clearances has reduced considerably keeping in tune with today's pace of activities.

I would like to appreciate the painstaking efforts by PTCC by bringing "Zero Unguarded Power Crossings" which has resulted in achieving nil incidences in fatal/non-fatal accidents to Outdoor/line staff/Phone Mechanics of BSNL. Statistics show that there have been significant improvements to Telecom Installations from induction current, earth potential rise etc., due to the consistent efforts of PTCC by providing appropriate protection.

The PTCC Manual 2010 has been given minute attention to details and I am sure it will remain as a testimonial for many times to come. All necessary prerequisites have been addressed in which the following procedures require special mention:

- Simplified procedure for co-ordination of Power Lines upto 33KV
- Step-by-step procedure for PTCC clearance of power Lines of 66KV & above
- Low frequency induction and procedure for conducting its test
- Protection from Earth Potential Rise

I am sure that this manual will be a very handy tool for Telecom, Power, Railways & Defense wing personnel and I take this opportunity to congratulate Central Electricity Authority and Inspection Circle for making sincere efforts in bringing out this 3rd edition of PTCC Manual 2010.

(GOPAL DAS)



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Message from Chief Engineer (LD&T) & Chairman Central PTCC

The infrastructure sectors like Power, Railway and Telecommunication plays an important role in the development at every stage of economic development in the country. During All India Power Engineers Conference held in 1949, it was recognized that for protection of telegraphic, telephone, and electrical signaling, the specialized studies required to compute the impact of induced voltages due to the proximity of Power and Telecommunication network. On the recommendation of the conference, Government of India constituted a Central Power and Telecommunication Coordination Committee (PTCC) in May 1949. The Central PTCC comprise of Members from Power, Telecom, Railway and Defense and is an excellent multi sector synergy forum.

The Central PTCC has been playing an important role in resolving technical issues, evolving standards and ensuring safe co-existence among various Power and Telecom operators. The Committee reviews the PTCC norm periodically in the context of technological and infrastructural changes and safety standards at par with International level.

The procedures and formats for processing of PTCC case has been well laid down. However, with time the advent of new technology in the field of telecommunication and power sector, the revision of PTCC manual (1995 edition) became imperative. The revised PTCC Manual has been prepared after getting the input from the stakeholders, through Central PTCC deliberations and getting comments from others by placing on CEA website.

The effort through PTCC Manual is to ensure that all the stake holders of Power, Telecommunication and Railways follow the procedures and complete the processing in time without any difficulty and delay, thereby eliminating the chances of any cost escalation of the project. The newly revised PTCC manual will work as a torch-bearer for all the stake holders especially for Central PTCC whose primary objective is to ensure the provision of safety aspects involved right from the conception stage.

I hope the revised PTCC document would provide useful reference in expediting and resolving the issues related for PTCC route approval and would facilitate to achieve the goal of mutual and safe co-existence of the various entities/stake holders in the business of Power and Telecommunication.

(A.K. AGGARWAL)
Chief Engineer/(LD&T) &
Chairman Central PTCC

JULY 2010

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Message from CGM, Inspection Circle, Jabalpur

In view of tremendous growth in Power and Telecom Sectors in the last 10 years, large no. of power proposals were processed by PTCC and route approvals were issued. The PTCC manual 1995 edition is referred by the Power and Telecom Officers, has now been revised. Also a new chapter on mutual coupling calculation as per CCITT directives has been added in the new PTCC Manual 2010.

The field engineers, both from Power and Telecom sectors as well as Railways and Defence will be highly benefited from the new Manual 2010, as it contains detailed procedure for calculation of Induced Voltage and standards for crossing of all categories of power lines from LT, HT to EHT (i.e.) 230 V to 765 kV.

It is also worth noting that important decisions taken on various Central PTCC up to October '09 has been included in the PTCC Manual 2010.

I take this opportunity to congratulate all the officers from Central Electricity Authority (LD & Telecom) and from Inspection Circle in bringing out the comprehensive PTCC Manual 2010 in time, and wish them all success in their future endeavour.

(JAMUNA PRASAD)
Chief General Manager,
Inspection Circle, Jabalpur



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(RAILWAY BOARD)
NEW DELHI-110001

MESSAGE

It is a great pleasure to see that CEA is publishing a new PTCC Manual. PTCC has played a major role in strategically working towards coordinating the safety issues between power and telecom sector resulting in unhindered growth in both power and telecom infrastructure of the country.

Railways being one of the members of PTCC, plays a vital role in PTCC approval as the railway telecom lines for train operations reach far and remote locations of the country. The boom in power sector is also pushing growth in far and remote places of the country. For sustained high rate of growth for the country it is important that both power and telecom infrastructure providers of the country make an all out effort to work together. The new PTCC manual will take care of the growth of the country's infrastructure by simplifying procedures and making necessary adjustments to balance speedy approval delivery in line with the growth targets keeping in view the human safety.

I wish all the members of PTCC will make the best use of the new revised manual for rendering a great service to the nation in helping speedy infrastructure building.

(R.C. AGRAWAL)
Additional Member (Telecom)
Ministry of Railways
(Railway Board)

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**Message from GM, Inspection Circle, BSNL &
Secretary (Telecom) Central PTCC**

In view of the overall economic development of the nation, the development of the country's infrastructure and hence expansion of Power, Telecom and Railways network becomes very crucial. With the increasing number of HV and EHV power transmission lines and Telecom & Railway lines being laid in the country, the role of PTCC becomes extremely important in safeguarding the personnel of the concerned departments and also the common man.

The new PTCC Manual 2010 edition is an improvement of the currently existing PTCC Manual 1995 edition, which provides additional information that will expedite the PTCC route approval procedure by improving the understanding of the engineers of various departments concerned with the PTCC process.

I would like to congratulate all the officers of the LD&T Division of CEA, Inspection Circle, BSNL and concerned Railway authorities in bringing out this latest edition of the PTCC Manual and wish them all the best in their future endeavours.

(G.C.MANNA)
General Manager
Inspection Circle, Jabalpur



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SEWA BHAWAN, RAMAKRISHNA PURAM

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NEW DELHI-110066 Dated :



Acknowledgement by Director (PTCC) CEA & Secretary (Power) Central PTCC

I, sincerely thank Chairman CEA, Member (GO&D) CEA, CMD BSNL, Chief Engineer (LD&T) CEA, Addl. Member (Telecom) Railway Board CGM (Inspection circle) BSNL and GM (Inspection Circle) BSNL for their message and acknowledging the PTCC Manual as a valuable book on PTCC activities. The messages will definitively inspire and enthuse the readers about their role, responsibilities and their contribution to be made towards PTCC.

It gives me pleasure to place the manual in the hands of the all users/stake holders for frequent references required for PTCC route approval/clearance and other related activities. Although most of the chapters have been based upon the earlier version, several parts and sections have been re-written or newly introduced. I have been guided by the feedback received by innumerable engineers from Power Sector, Telecom Sector and Indian Railways across the country.

All the members of the Central PTCC deserve a special mention for their support and encouragement. I also wish to acknowledge the valuable contribution from all the members of the Sub-Committee formed to revise the PTCC Manual. My sincere thanks to all those persons directly or indirectly associated with this PTCC Manual.

I shall be grateful to the readers who point out errors and omissions which, inspite of all care might have been there. Suggestions for improvement & further enhancement of the scope of the manual are co-cordially invited.

**(D.K. MALIK)
Director PTCC &
Secretary (Power)
Central PTCC**

July 2010

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EXECUTIVE SUMMARY

The new edition of PTCC Manual relates to the protection of the telecommunication lines against the adverse effects of electricity lines. Section 160 of the Electricity Act, 2003 gives directions about the Protection of Telegraphic, Telephone and Electrical Signaling. It states that “Every person generating, transmitting, distributing, supplying or using electricity shall take all reasonable precautions in constructing, laying down and placing his electric lines, electrical plant and other works and in working his system, so as not injuriously to affect, whether by induction or otherwise, the working of any wire or line used for the purpose of telegraphic, telephone or electric signaling communication, or the currents in such wire or line.”

The same provisions about the safety of Telecommunication circuits existed in the earlier Indian Electricity Act also. During All India Power Engineers’ Conference held in 1949, it was recognized that the subject of co-existence of Power & Telecommunication System involves considerable amount of specialized study and it was recommended to the Central Government for formation of Central Standing Committee for coordination of Power and Telecommunication Systems. On the basis of their recommendation, a standing committee was formed by the Central Government in May, 1949 by the name of “Central Power & Telecommunication Co-ordination Committee”(PTCC). Since its inception in 1949, the composition of Central PTCC has been revised twice by the Govt of India, first reconstitution was done in 1982 and the second in 2001 vide Ministry of Power resolution dated 11th April, 2001 making Chief Engineer (LD&T) CEA & CGM (Inspection Circle) BSNL as Chairman of the Committee in alternate years. The other members of the Committee are from Power, Telecommunication, Railways and Defense. The Committee reviews the PTCC norms periodically in the context of the technological and infrastructural changes and safety standards at par with the international level which allows the problem to be treated with greater precision. Since this committee is 60 years old, the manual contains some historical information about PTCC and important decisions taken by the Central PTCC.

Due to rapid expansion of Power and Telecommunication Sectors, it became necessary to decentralize the Central PTCC for carrying out the processing of PTCC cases up to 33 kV at state level. Accordingly on the recommendation of Central PTCC, the Central Govt in 1968 constituted a State Level PTCC in each state. During the conference of Chairman State Electricity Boards in January 1978, the processing of power line cases up to 132 kV level was also entrusted to SLPTCC. The latest re-constitution of SLPTCC was notified by Ministry of Power vide letter dated 14.03.2001.

For the co-existence of all these service sectors it becomes very important to lay norms, guidelines and codes of practice to mitigate any danger or disturbance on the telecommunication circuits. The PTCC Manual gives all the necessary instructions, directions, procedures and codes of practice to be followed to avoid any conflict of interest in location of power lines and telecom installations.

The main features of the revised PTCC Manual are summarized as follows:

- Important decisions taken by Central PTCC.
- Procedure to apply for PTCC route approval.
- Flow chart depicting the various stages involved in PTCC route clearance.
- Revised Time Limits for various stages involved in PTCC clearance.
- Method to calculate Induced Voltages.
- A new chapter on calculation of Mutual Coupling (MC). The two examples of M.C calculations have been reproduced from the CCITT Directives.
- Ready Reckoner for calculation of Mutual Coupling.
- Code of practice for laying of Underground Power Cables up to 220 kV in proximity with U/G telecommunication cables.
- Setting up of Re-Engineering Supervisory Committee.
- Screening factor of underground cables used by BSNL.
- Latest postal addresses of all the sixteen zones of Indian Railways along with their jurisdiction.
- Latest postal address of all the DET's (PTCC) along with their jurisdiction.

The PTCC Manual will help both Power and Telecommunication Utilities of Public/ State/Private sectors to achieve the goal of mutual and safe co-existence. The Manual will also facilitate PTCC clearances for erecting the Power Transmission Lines and Communication network.

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