



भारत सरकार/ Govt. of India

विद्युत मंत्रालय/Ministry of Power

केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority

मुख्य विद्युत निरीक्षणालय प्रभाग/ Chief Electrical Inspectorate Division

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सं: CEI/CEA/1/18/2017/1946

दिनांक : 10/10/2017

To

Shri Sanjay Shrivastava, Chief Engineer (PSETD), CEA, Sewa Bhavan, R K Puram, New Delhi.	Shri A K Vyas, Addl. GM (Engg. TL), PGCIL, Corporate Office, Saudamini, Plot No. 2, Sector 29, Near IFCO Chowk, Gurugram 122 001.
Shri D Revanna, Joint Director/HoD, Mechanical Engineering Division, Central Power Research Institute, Prof. Sir C V Raman Road, Sadashivanagar PO, PB No. 8066, Bengaluru 560 080	Dr. P K Umesha, Chief Scientist & Head, Tower Testing & Research Station, CSIR-Structural Engineering Research Centre, Tirusulam, Chennai 600 043

Subject: Minutes of the first meeting of the Committee for Audit of Transmission Tower with respect to design and life of the tower (on a 5% sampling basis) held on 19.9.2017 at 11.00 AM in the Room of Member (PS), CEA.

Sir,

Please find attached the Minutes of the first meeting of the Committee for Audit of Transmission Tower with respect to design and life of the tower (on a 5% sampling basis) held on 19.9.2017 at 11.00 AM in the Room of Member (PS), CEA. Kindly acknowledge the receipt.

Yours faithfully,

(Goutam Roy)
Member Secretary

Encl: As above

Copy to:

1. Shri P S Mhaske, Member (Power System), CEA, Sewa Bhavan, R K Puram, New Delhi
2. Under Secretary to the Govt. of India (Sh. Bihari Lal), Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110 001.

Minutes of the first meeting of the Committee for Audit of Transmission Tower with respect to design and life of the tower (on a 5% sampling basis) held on 19.9.2017 at 11.00 AM in the Room of Member (PS), CEA.

List of the participants present in the meeting is Annexed.

Member (PS) welcomed the participants and stated that the meeting has been convened to discuss the audit of transmission towers with respect to design and the life of the towers (on a 5% sampling basis). In this context he stated that Ministry of Power has formed the Committee with Member(PS), CEA as its Chairman and other members from CEI division of CEA, POWERGRID, CPRI and Structural Engineering Research Centre (SERC) under CSIR. He stated that MoP while formation of the committee has not included any officer from the PSETD division dealing with tower design from CEA as member. Accordingly, his office has already requested the MoP for inclusion of Chief Engineer, PSETD as an expert member of the Committee. However, no response from MoP has been received in this regard so far, so, considering the need for the expert advice of PSETD Division of CEA, Chief Engineer (PSETD) is being inducted in the Committee as a Member.

He further stated that the need for formation of the committee has been envisaged by MoP, due to the failure of few high voltage transmission towers near Delhi, Rajasthan, Madhya Pradesh area in the recent past, beside the information received from various quarters regarding the need for condition monitoring of many of the transmission towers. Member (PS) requested Chief Electrical Inspector (CEI), CEA (Member Secretary of the Committee) to proceed with the agenda of the meeting.

Member-Secretary/CEI, CEA stated that the Ministry of Power vide its letter dated 7.8.2017 has requested Member (PS), CEA to formulate a Committee under his Chairmanship to audit the transmission tower with respect to design and life of the towers (on a 5% sampling basis). MoP has included Chief Electrical Inspector, CEA as Member-Secretary of the Committee, COO (CTU, PGCIL), representative from CPRI and Structural Engineering Research Centre of CSIR as Members. Office of the CEI, CEA has written to CPRI as well as CSIR for nominating the expert Member from their organization. CPRI and CSIR has nominated the following members to represent the Committee:

- i) Shri D Revanna, Joint Director/HoD, Mechanical Engineering Division, Central Power Research Institute, Bangalore.
- ii) Dr. P K Umesha, Chief Scientist & Head, Tower Testing & Research Station, CSIR-Structural Engineering Research Centre, Tirusulam, Chennai

He further stated that with the consent of Member (PS), CEA/Chairman of the Audit Committee, the first meeting of the Committee has being convened on 19.9.2017. Member-Secretary/CEI, CEA stated that presently the transmission network in the country are inter linked and with the failure of any part of the system, the other part of the grid suffers a huge loss in terms of overloading of transmission line and load shedding. He stated that as indicated by Member (PS), CEA, there has been some repeated failure of high voltage transmission towers at various part of the country and as a result of that there were interruption of power supply to that portion of the grid for several days and also

caused huge constrain in power transmission network to other part of the grid. As such, there is a need for condition monitoring and to maintain the tower in a good condition. With this concern, MoP has formed the Committee for audit of the transmission tower. As such, the Committee would decide the following few aspects for the audit:

- i. Methodology and the process of the audit to be carried out.
- ii. Criteria for selection of the transmission towers for the audit.
- iii. Process of carrying out the auditing
- iv. Coopting representative of State utilities

Methodology and the process of the audit to be carried out

a. The first issue for the Committee is to decide the methodology for carrying out the audit. The issue was discussed with the members and they were generally of the view that considering the extensive high voltage transmission network existing in the country it would not be physically possible to audit the transmission towers starting from the lower voltage i.e. 132 kV and above. As such, the members were of the view that the audit should be limited to the transmission tower of 400 kV and above voltage. The members also opined that the inter-state 220 kV transmission towers wherever exist should also be covered under the audit.

b. Presently the transmission towers in the country belongs to (i) Central Sector with Powergrid and Private Sector as owners and (ii) under State Sector. It was agreed by members that even though the private sector entering into the transmission business through TBCB route is a recent phenomenon but still there has been some failure of 400 kV transmission towers belonging to private sector. Considering this, it was decided that the ratio on which the audit is to be carried out for Powergrid, Private Sector and the State Sector transmission towers would be 33% each.

c. The design and data for the transmission line, which would be selected for the purpose of audit would be obtained from the concerned agencies. The design and data would be verified based on the existing codes and practices.

d. For the auditing purpose the members were of the view that considering the huge number of sample to be audited, it would not be practically feasible for the Committee to visit and audit all the site. Members from CPRI and CSIR also stated that they have also conducted telecom tower audit but with the help of some specialized agencies as they also do not have the required manpower to carry out the audit as extensively required in the present case. Therefore, the Committee was of the view that there is a need for engaging the specialized agency for helping/assisting the audit of the selected transmission towers.

Criteria for selection of the transmission towers for the audit.

The issue of the selection of transmission tower to be covered under the audit was discussed in detail and the members were generally of the view that

the following criteria needs to be adopted for selection of transmission towers to be covered under audit:

- i) The transmission line/towers which are commissioned before 1990.
- ii) Criticality of the transmission line with respect to the power transmission system in the region.
- iii) Frequency of failure of transmission line on account of tower failure.
- iv) The line which passes through polluted area, especially close to refinery or chemical factories or passing through the coastal areas.
- v) The transmission towers which are in the flood prone zone/near the river bed.
- vi) The transmission lines which are in the high wind zone

Process of carrying out the auditing

For carrying out audit the following procedure would be adopted:

- i) For carrying out the audit in the States there would be a need for coordination with the State agencies. Therefore, it was decided that a region-wise meeting for the audit would be convened by Member (PS) with the Chief Engineers of Transmission agencies of each state. This would help in getting the feedback regarding the condition of the transmission system as well as identifying the transmission towers that needs to be covered under the audit.
- ii) For conducting the audit of the Central Sector tower, the nodal agency would be the experts from SERC and CPRI, one member from CEA, representative from POWERGRID and experts selected from the respective States and the agency selected for carrying out the audit. For carrying out audit in the private sector line, the nodal agency should be CPRI, CSIR, Poweregrid, Member from CEA, representative from private sector and the agency selected for carrying out the audit and for carrying out audit in the State Sector line, the nodal agency would be CPRI, CSIR, Powergrid, CEA, representatives from state and the agency selected for carrying out the audit. The Committee on its discretion may include any expert from private sector as a part of the audit team.
- iii) The data verified by the Committee would be checked based on the physical verification of the tower and also by carrying out the tests of mechanical strength of the tower element which may be done by replacing a redundant member of the tower and carrying out the test on the member to understand the mechanical properties and residual life of the tower.
- iv) Member (PS) stated that for facilitating the process of tower auditing, it would be helpful if the representatives from some of the Transcos are also nominated in the Committee so that they can give inputs regarding the States point of view for the tower to be audited. Accordingly, it was decided that to start with the representative from the following Transcos may be incorporated in the committee:
 - (a) Maharashtra

- (b) Gujarat
- (c) Tamil Nadu
- (d) West Bengal
- (e) Rajasthan

Member (PS) stated that the CMDs of the Transcos of these States may be requested to nominate suitable officers from their organization of the rank of Chief Engineer for representing the Committee.

It was further decided that a basic checklist for carrying out the audit for the transmission towers should be developed by SERC so that the same could be given to the audit teams. CPRI was asked to formulate the cost estimate for carrying out the audit on each transmission tower. This should include the cost of hiring of external agencies for the audit and travel and other expense for the audit team who would be assigned to visit the site.

Member (PS) stated that based on the audit, a report would be prepared and placed before the Committee for discussion. After the Committee finalized the report the same would be sent to the Ministry of Power on quarterly basis. He further stated that representatives from CPRI and SERC should submit the respective tasks assigned to them within a weeks' time frame and for finalizing the audit procedure another meeting of the Committee would be convened in the second week of October, 2017.

The meeting ended with the vote of thanks to the Chair.