



भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority
विद्युत प्रणाली अभियांत्रिकी एवं प्रौद्योगिकी विकास प्रभाग
Power System Engineering & Technology Development Division

दिनांक: 06.04.2026

सेवा में,

<As per attached list>

विषय: Minutes of the meeting of Standing Committee of Experts on failure of EHV transmission towers failed during the period from July, 2025 to December, 2025-reg.

महोदया/महोदय,

A meeting of the Standing Committee of the Experts was held under the chairmanship of Chief Engineer (PSE&TD), CEA on 10.03.2026 at CEA, New Delhi to discuss the cause of failures of the transmission line towers reported by various utilities to CEA that had failed during the period from July, 2025 to December, 2025.

2. In this regard, minutes of the meeting of the Standing Committee are enclosed herewith for kind information and necessary action by all concerned.

Encl: As above

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**Minutes of the meeting of Standing Committee of Experts
on failure of EHV transmission towers failed during the
period from July 2025 to December 2025**



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**1. Index for Tower failure reported for the period from July, 2025 to December, 2025**

Sl. No.	Name of Utility	Name of EHV Line	Region	Date of occurrence of Failure	Date of intimation of failure	Date of submission of report	Page no.
1	PGCIL	765 kV S/C Koteswar Meerut transmission line	NR	11.08.2025	12.08.2025	29.08.2025	28
2	PGCIL	400 kV Chamera II – Chamera I Transmission Line	NR	26.08.2025	26.08.2025	05.03.2026	30
3	PGCIL	400 kV Chamera II – Kishenpur Transmission Line	NR	06.09.2025	06.09.2025	05.03.2026	33
4	PGCIL	765 kV S/C Lucknow - Bareilly Line	NR	03.09.2025	03.09.2025	05.03.2026	36
5	GETCO	220 kV Shivilakha - PS2 Line / 220kV Shivilakha - Sankhari Line	WR	08.09.2025	12.09.2025	23.01.2026	41
6	Adani	400 kV Solapur-Kolhapur (CKT-2) & 400KV Solapur- Alkud (CKT-1) Transmission Line	WR	25.09.2025	25.09.2025	27.09.2025	43
7	IndiGrid	400 kV D/C JALANDHAR(PG)- SAMBA(PG) (NRSS XXIX) Line	NR	26.08.2025	27.08.2025	05.03.2026	46



2. Background

Under Section 73, Clause (I) of the Electricity Act, 2003, CEA vide office order no: 5-41/98/Secy/CEA/809 dated 24.09.1999 constituted a Standing Committee of Experts in the field of design and operation of EHV transmission line towers from CEA, various transmission utilities and research/academic institutes to investigate the failure of 220 kV and above voltage class transmission line towers and recommend measures to avert recurrence of such failures in future. The Committee was reconstituted vide CEA office order no: CEA/5-41(18)/Secy-2012/166 dated 08.08.2012 (**Annexure-IV**).

The objective of the Standing Committee is to investigate the causes of failures, deliberate on the failures of transmission line towers of various Power utilities, suggest remedial measures to prevent recurrence of such events in future and prepare a report which would serve as a repository of case studies of failures and suggested remedial measures for future.

As per CEA (Measures relating to Safety and Electric Supply) Regulations, 2023, all utilities are required to report any event of failure of 220 kV & above voltage class transmission line towers within 48 hrs, and submit a detailed report to CEA as per stipulated format (available on CEA website and is enclosed at **Annexure-III**) covering reasons for failure and measures taken/ to be taken to avoid recurrence of such failures. As part of this activity, CEA has been receiving reports of failures of various Towers of 220 kV and above voltage class transmission lines from power utilities.

In this connection, a meeting of the Standing Committee of Experts to investigate the failure of 220 kV and above voltage class Transmission Line Towers that occurred during the period from July, 2025 to December, 2025 was held on 10.03.2026 at CEA HQ, New Delhi under the Chairmanship of Chief Engineer (PSE&TD), CEA and Chairman of the Standing Committee. List of participants is given at **Annexure-I**.

3. Introduction

Sh. N.R.L.K. Prasad, Chief Engineer (PSE&TD), CEA and Chairperson of the Standing Committee welcomed all the Members and participants to the meeting of the Standing Committee of Experts to investigate the failure of EHV transmission line towers. At the outset, he informed that the Standing Committee meetings are conducted periodically to review tower failure incidents reported by utilities and to analyse the causes of such failures so that suitable recommendations may be made to avoid recurrence of similar incidents in future.

He informed that during July, 2025 to December, 2025 period, the number of failure incidents reported was comparatively lower than that reported during past 6-month periods. He stated that total 07 Nos. of EHV transmission line failure incidents were reported to CEA by 04 Nos. of utilities, namely PGCIL, GETCO, Adani Energy Solutions Limited (AESL) and IndiGrid. These incidents involved failure of 17 Nos. of transmission towers, out of which 10 Nos. of towers were of suspension type and 07 Nos. of towers were

of tension type. He mentioned that although the number of failures were relatively small, it is still important to analyse each event carefully to investigate the causes for such failures.

He further emphasized that one of the major issues repeatedly observed by the Committee is delay in reporting tower failure incidents by utilities. He stated that the Committee has been consistently emphasizing the need for timely reporting of tower failures. However, in several instances utilities either report the failures after considerable delay or submit incomplete information. Further, he mentioned that such delays make it difficult for the Committee to undertake timely examination and analysis of the failure events and conduct site visits wherever required.

It was informed that as per Regulation 48 (8) of CEA (Measures relating to Safety and Electric Supply) Regulations, 2023, failures of any 220 kV and above voltage level transmission line tower shall be reported by the owner utility within 48 hours of occurrence of the failure, to the Authority, and the reasons for failure and measures to be taken to avoid recurrence of failure shall be sent to the Authority within one month of the occurrence as per stipulated formats, along with all the additional information (images, duly filled CEA Proforma, wind speed data, coordinates of failed towers, patrolling data, material test reports on failed tower members from NABL accredited labs). He requested all the utilities to furnish the closure report for the event within stipulated time including all the details and records. All the utilities were requested to adhere to these timelines strictly.

He further observed that proper representation from utilities during such meetings is also essential. In many cases the representatives attending the meeting are not fully aware of the technical details of the failure incidents and therefore are not able to provide adequate explanation during the deliberations. He advised utilities to ensure that the deputed representatives for the meetings are well acquainted with the details of the failure incidents so that meaningful discussions can take place.

He also highlighted that one of the important aspects in analysing tower failures is the availability of reliable wind speed data at the tower locations. In several failure cases of previous meetings, utilities have reported high wind speeds or cyclonic wind conditions as the probable cause of failure. However, this cause must be supported with authentic wind speed data obtained from reliable sources. He further, mentioned that the tower design should be based on latest codal provisions and for design of transmission line structures in eastern coast and Gujarat coast upto 60 km from sea coast, importance factor for cyclonic region i.e. K4 factor should be taken care of as per CEA regulations.

The Chairperson of the Standing Committee further emphasized on the revision of the Wind Zone Map of India, which is an important parameter for the design of transmission line towers. The existing wind zone map was prepared based on earlier data and therefore there is a need to review and update it using more recent meteorological data. He informed that discussions had earlier been held with the India Meteorological Department (IMD) regarding availability of wind data across the country. IMD has established a large number of Automatic Weather Stations (AWS) which measure various meteorological parameters including wind speed. According to the information shared by IMD, a large network of such stations is already operational across the country, which may be utilized for obtaining wind data. He also mentioned that for obtaining wind speed data, utilities may need to coordinate with relevant agencies



such as IMD or other organizations having real time wind speed data, and appropriate arrangements may be required for accessing the data.

He mentioned that apart from tower failures, issues relating to insulator failures in transmission lines have also been observed in recent years. A separate committee has been constituted to examine the performance of different types of insulators used in the transmission system. The committee has been analysing the available data and is in the process of preparing its report.

He emphasized that the objective of analysing such issues through expert committees is not to identify faults with any particular utility or manufacturer, but to understand and analyse the technical reasons behind such failures and to recommend suitable measures to avert recurrence in future that can improve the reliability of the transmission network. He stated that CEA would also facilitate the utilities in respect of the mechanism /modalities to get the wind speed data from IMD after consulting with IMD subsequent to the meeting.

Smt. Kavita Jha, Director (PSE&TD), CEA and Member Secretary of the Standing Committee welcomed all the participants present in the meeting and thanked them for attending the Standing Committee meeting to deliberate upon the agenda points of the meeting. She emphasized on the importance of timely reporting of tower failure incidents to CEA so that the Committee can examine and analyse the causes of failure events properly and, wherever necessary, undertake site visits to investigate the causes of failure. She also emphasized that timely reporting and submission of detailed information are essential for realistic technical analysis of the failure events.

4. Deliberations held during Standing Committee Meeting

A. Action Taken Report (ATR) on Standing Committee Recommendations

- (i) Chief Engineer (PSE&TD), CEA informed that CEA vide letter dated 28.10.2025 requested all Member Utilities to furnish the status of action taken with respect to the recommendations made by the Standing Committee in its previous meetings. These recommendations mainly pertained to status of digitization of transmission assets, spares and inventory management, adopted operation and maintenance practices for transmission lines, adoption of K_4 factor, reliability levels and drag coefficients in transmission line tower design as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, status of conformance to latest codal provisions for newly erected towers and procured spares, authenticated reasons, wherever wind data could not be furnished for tower failure events, along with efforts made to obtain such data from IMD.
- (ii) Status of action taken by various utilities on the recommendations of the Standing Committee as per the inputs received from the utilities was presented during the meeting. The CEA presentation

included the status of the responses received from different utilities regarding the implementation of the recommendations and the measures taken by them in this regard.

- (iii) During the discussion, it was observed that inputs from most of the utilities are still awaited. Chief Engineer (PSE&TD), CEA advised concerned utilities to furnish the pending information at the earliest so that implementation status of the recommendations made by the Standing Committee could be properly reviewed.
- (iv) The Committee reiterated that recommendations made in the previous meetings are aimed at improving the reliability of the EHV transmission system and therefore utilities should ensure that appropriate action is taken on these recommendations and the status of implementation is communicated to CEA in a timely manner.

B. Action Taken on Recommendations of the Task Force on Cyclone Resilient Robust Electricity Transmission and Distribution Infrastructure in coastal areas

- (i) Chief Engineer (PSE&TD), CEA informed the Committee that CEA vide letters dated 15.10.2025 and 28.10.2025 requested concerned utilities to furnish the status of action taken on the recommendations of the Task Force on Cyclone Resilient Robust Electricity Transmission and Distribution Infrastructure in Coastal Areas. These recommendations were issued with the objective of strengthening the resilience of transmission and distribution infrastructure in coastal regions which are vulnerable to extreme weather events such as cyclones and high wind speeds.
- (ii) Status of action taken by various utilities on the recommendations of the Task Force based on the inputs received from the utilities was presented during the meeting.
- (iii) During the deliberations, it was observed that responses from some utilities are still awaited. Chief Engineer (PSE&TD), CEA advised concerned utilities to furnish the pending information at the earliest and also requested them to follow the recommendations of the Task Force and take appropriate measures for strengthening transmission infrastructure located in cyclone prone areas.
- (iv) The Committee noted that adoption of appropriate design and construction practices in coastal regions is essential to enhance the resilience of transmission infrastructure against cyclonic events and therefore utilities should examine the recommendations of the Task Force carefully and implement the same wherever applicable.

C. M/s Jindal Steel Limited (JSL) Proposal for Use of Higher-Grade Structural Steel (E350/E410/E450), H-Pile foundation, and Hollow Sections in Transmission Lines

- (i) Chief Engineer (PSE&TD), CEA informed the Committee that CEA had received a proposal from M/s Jindal Steel Limited (JSL) regarding the use of higher-grade structural steel, hollow steel sections in tower members and H-Pile foundations in transmission line towers. The matter had already been circulated among the members of the Committee through agenda note.
- (ii) With regard to use of higher-grade structural steel such as E350, E410 and E450 in transmission line towers as proposed by M/s JSL, Chief Engineer (PSE&TD), CEA stated that in RFP of TBCB projects, structural steels of grade E250 and E350 are prescribed as per IS 2062. It was indicated that adoption of higher -grade steel could lead to optimization of tower weight and reduction in tower material quantity while maintaining the required structural strength.

During the deliberations, the members discussed various aspects related to the use of higher-grade steel including structural design considerations, fabrication practices and quality control during manufacturing of tower members. The Committee noted that although higher grade steel may offer certain advantages in terms of tower member/material optimization, its use in transmission towers would require careful evaluation with respect to design practices, supply chain and compliance with the applicable standards for tower design, and passing of all necessary prescribed tests.

It was also deliberated to ensure the following tests on the towers designed with the proposed higher grade of structural steel:

- Towers shall pass the % elongation criteria which is recommended as 23% for grade E250 and E350, 21% for grade E450 and 19% for grade E550.
- Fatigue test by CPRI or any other Govt. agency
- Proto testing of Towers.

After deliberations, it was concluded that JSL may be requested to approach CPRI, CSIR-SERC, or any other competent Government agency with detailed design and all relevant data pertaining to tower design using higher-grade structural steel (E410 and E450), and get them validated including requisite testing. After their successful validation, a formal proposal covering validated design, detailed drawings, relevant test reports, and other pertinent data may be submitted by JSL for further action in the matter.

- (iii) With regard to use of hollow steel sections in transmission line towers as proposed by M/s JSL, Chief Engineer (PSE&TD), CEA highlighted that RFP document for TBCB projects is not restricting use of hollow sections.

During the deliberations, the representative of CPRI highlighted issues related to welding, fabrication, galvanization and maintenance of such members. The Committee noted that adoption of hollow steel sections in transmission towers would require careful consideration of design methodologies as well as fabrication and quality control aspects.

- (iv) With regard to use of H-Pile foundations for transmission line towers as proposed by M/s JSL, Chief Engineer (PSE&TD), CEA highlighted that RFP document for TBCB projects is not restricting use of H-beams. It was deliberated that H-Pile foundations could be useful in locations where conventional foundations may not be feasible due to difficult soil conditions or other site constraints/ challenges. It was also agreed that H-beam should be based on corrosion resistant steel.

D. Details of Tower Failure Incidents (July, 2025 – December, 2025)

1. During the period from July, 2025 to December, 2025, total 07 Nos. of EHV transmission line failure incidents were reported to CEA by 04 Nos. of utilities, namely PGCIL, GETCO, Adani Energy Solutions Limited (AESL) and IndiGrid. These incidents involved failure of 17 Nos. of transmission towers, out of which 10 Nos. of towers were of suspension type and 07 Nos. of towers were of tension type. Complete details of all the reported EHV Transmission Line Tower failures are given at **Annexure-II**. The details of the deliberations of the standing committee meeting are presented in the ensuing paragraphs.
2. The representative of **Power Grid Corporation of India Limited (PGCIL)** presented the details of tower failure incidents pertaining to 04 Nos. of transmission lines in which 06 Nos. of Towers failed (01 No. Suspension Tower and 05 Nos. Tension Tower) which were reported during the period from July 2025 to December 2025. The transmission line-wise deliberations are summarized below.

(i) 765 kV S/C Koteswar – Meerut Transmission Line

The representative of PGCIL informed that two towers, namely tower location nos. 141 and 142, of the 765 kV S/C (Quad Bersimis) Koteswar – Meerut transmission line collapsed on 11.08.2025. The line was commissioned in the year 2011 and the total line length is approximately 179 km.

It was informed that tower location no. 142 was situated close to the bank of River Song. As part of earlier preventive measures, gabion wall protection had been provided around the tower foundation to safeguard the tower against possible erosion from the river. However, during the

incident flash flooding occurred in River Song due to heavy rainfall in the upstream region, resulting in sudden rise in water level and strong river currents.

PGCIL representative informed that the high velocity of water flow along with debris and large wooden logs carried by the flood resulted in washing away of the gabion wall protection provided around the tower foundation. Due to this, the tower chimney and foundation became exposed and the supporting soil around the foundation was eroded. As a result of this erosion and exposure of the foundation, tower no. 142 lost stability and collapsed. Following the collapse of tower no. 142, the adjacent tower at location no. 141 also collapsed as consequential damage due to the sudden transfer of mechanical loading and tension through the conductors.

During the deliberations, Chief Engineer (PSE&TD), CEA enquired whether any members of the tower structure or nuts and bolts were found missing or damaged after the collapse. The representative of PGCIL clarified that the tower members were largely intact and the failure was primarily associated with foundation instability caused by erosion of soil beneath tower foundation rather than structural weakness of tower members.

Chief Engineer (PSE&TD), CEA also enquired whether additional protection measures were planned at the location considering the vulnerability of towers located close to riverbanks. PGCIL representative informed that restoration work had already been undertaken and additional protective measures were being examined to prevent recurrence of such incidents.

It was noted that site visit for the subject event was undertaken by the standing committee during 18-19 August, 2025. Based on their findings, and above deliberations, it was suggested that for all tower foundations in the areas prone to river flooding, suitable fencing/ gabion wall may be provided.

After detailed deliberations, it was concluded that the primary cause of failure was flash flooding in River Song due to change of course of river which resulted in erosion of soil beneath the foundation of Tower and land exposure of the tower foundation.

(ii) 400 kV Chamera-II – Chamera-I Transmission Line

The representative of PGCIL informed that in the 400 kV Chamera-II – Chamera-I transmission line one tower at location nos78 collapsed on 26.08.2025. It was reported that the region experienced heavy rainfall in the upstream catchment areas which resulted in flash flooding in River Ravi and River Sewa. Due to the sudden increase in water flow and high-water velocity, erosion occurred around the tower foundation. The representative explained that the excessive water flow washed away the soil around the tower foundation which weakened the support of the foundation and resulted in instability of the tower.

During the discussion, the Chief Engineer (PSE&TD), CEA raised concern on the unacceptable delay in submission of the failure report and asked whether any protective measures had been provided

around the tower foundation to safeguard it against erosion. The representative of PGCIL informed that the tower foundation had been designed as per the prevailing site conditions and soil parameters; however, the sudden and intense flooding event resulted in erosion around the foundation.

After deliberations, the Committee observed that such failures are often associated with sudden hydrological events and concluded that the failure occurred due to flash flooding and erosion around the tower foundation caused by heavy rainfall in the upstream catchment areas.

(iii) 400 kV D/C Chamera-II – Kishenpur Transmission Line

The representative of PGCIL informed that in the 400 kV Chamera-II – Kishenpur transmission line one tension tower at location no. 238 collapsed due to instability of the surrounding terrain. It was reported that the area experienced continuous and heavy rainfall which resulted in weakening of the soil strata and land sinking in the vicinity of the tower location. The prolonged rainfall caused saturation of soil and gradual settlement of the ground supporting the tower foundation. Due to this ground settlement and land subsidence, the tower foundation lost stability which ultimately resulted in collapse of the tower.

During the deliberations, Chief Engineer (PSE&TD), CEA raised concern on the unacceptable delay in submission of the failure report and asked whether the tower location was situated in a hilly or geologically sensitive area where such land movement could occur. The representative of PGCIL informed that the tower location was situated in terrain where prolonged rainfall could lead to soil weakening and ground movement.

Chief Engineer (PSE&TD), CEA also enquired whether any geotechnical assessment had been undertaken after the failure to understand the soil behaviour at the site. The representative informed that investigations were undertaken and the findings indicated soil weakening due to prolonged rainfall. In this regard, it was suggested that suitable measures such as undertaking soil investigation, provision of retaining wall, finding alternate route not affected by land sinking, and erecting towers conforming to latest codal provisions be given due consideration.

After detailed deliberations, it was concluded that the failure occurred due to massive land sinking and ground instability caused by prolonged heavy rainfall in the region.

(iv) 765 kV S/C Lucknow – Bareilly Transmission Line

The representative of PGCIL informed that two towers, namely tower location nos. 565 and 566, of the 765 kV S/C Lucknow – Bareilly transmission line collapsed during the review period. The representative explained that the collapse occurred due to flash flooding in River Devha due to opening of flood gates of Nanak-Sagar Dam which resulted in severe erosion around the tower foundations. Due to the sudden increase in water flow and strong river currents, the soil supporting

the tower foundations was eroded. As the supporting soil was washed away, making the towers unstable and the towers eventually collapsed.

During the deliberations, Chief Engineer (PSE&TD), CEA enquired about restoration of the transmission line following the incident. PGCIL representative informed that temporary restoration of the line was carried out immediately and permanent restoration works were subsequently undertaken to bring the line back into service. Chief Engineer (PSE&TD), CEA also asked whether any additional protective measures were being considered to prevent similar incidents in future. The representative informed that protective measures were being examined as part of the restoration work.

It was noted that site visit for the subject event was undertaken by the standing committee during 12 September, 2025. Based on their findings, and above deliberations, it was suggested that restoration of towers should also be based on latest codal provisions and soil assessment should be done for the towers placed near river/dam and which is subjected to flood.

After deliberations, it was concluded that the primary cause of failure was flash flooding in River Devha which led to erosion of soil around the tower foundation and subsequent collapse of the towers.

3. The representative of **Gujarat Energy Transmission Corporation Limited (GETCO)** presented the details of tower failure incidents pertaining to 01 No. of transmission line in which 01 No. Suspension Tower failed which was reported during the period July 2025 to December 2025. The transmission line failure deliberation is summarized below.

(v) 220 kV Shivlakha – PS2 / Shivlakha – Sankhari Transmission Line

The representative of GETCO informed that in the 220 kV Shivlakha – PS2 / Shivlakha – Sankhari transmission line, one suspension tower located at location no. 60/563 collapsed on 08.09.2025. The tower was a common tower supporting both circuits of the transmission line. The line length is approximately 211 km and the tower type at the failed location was reported as DA+0 type double circuit tower. It was informed that the tower failure occurred following heavy rainfall in the surrounding region which resulted in the failure of the nearby Mewsa–Gagodar dam. Due to the dam wall damage, a sudden and significant flow of water occurred towards the tower location which resulted in erosion of soil around the tower foundation.

GETCO representative explained that the sudden inflow of water caused washing away of the soil supporting the tower foundation which led to instability of the foundation and eventual collapse of the tower. The tower failure was therefore attributed to erosion of foundation soil caused by the sudden flow of water following the dam breach. The representative further informed that the wind speed recorded at the nearby observatory at the time of the incident was about 6 km/h, which indicated that wind was not a contributing factor in the failure of the tower.

During the deliberations, Chief Engineer (PSE&TD), CEA enquired whether the tower location was situated close to the dam or within the path of water discharge following the damage of the dam wall. The representative of GETCO clarified that the tower location was situated in the vicinity of the area affected by the sudden release of water after the failure of the dam, which resulted in the erosion of the soil supporting the tower foundation.

Chief Engineer (PSE&TD), CEA further asked whether any protection measures had been provided at the tower location to safeguard the foundation from possible erosion. The representative informed that the tower had been designed as per the prevailing soil conditions and no specific river protection measures were required earlier; however, the sudden dam failure and consequent water flow created conditions that led to erosion around the foundation.

Chief Engineer (PSE&TD), CEA also enquired about the restoration of the line following the tower collapse. The representative informed that restoration work was undertaken immediately after the incident and the tower was reconstructed and the transmission line was restored and charged on 20.09.2025.

After detailed deliberations, the Committee observed that the tower failure occurred due to erosion of soil around the tower foundation caused by sudden inflow of water following the failure of the nearby dam. The Committee noted that the recorded wind speed at the time of the incident was very low and therefore wind loading was not a contributing factor in this failure.

4. The representative of **Adani Energy Solutions Limited (AESL)** presented the details of tower failure incidents pertaining to 01 No. of transmission line in which 05 Nos. of Suspension Towers failed which were reported during the period July 2025 to December 2025. The transmission line-wise deliberations are summarized below.

(vi) 400 kV Solapur-Kolhapur (CKT-2) & 400KV Solapur-Alkud (CKT-1) Transmission Line

The representative of Adani Energy Solutions Limited informed that in the 400 kV Solapur-Kolhapur (CKT-2) & 400KV Solapur-Alkud (CKT-1) Transmission Line, five suspension towers collapsed during the incident which occurred on 25.09.2025/26.09.2025. The representative explained that the tower failure occurred due to severe flooding in the Sina River which flows in close proximity to the tower locations. It was informed that the region experienced intense rainfall during the period which resulted in significant inflow of water into upstream reservoirs. Consequently, a large quantity of water was released from the Ujani Dam (3.70 Lakh Cusecs within span of 4 days) located in upstream of the affected area. The discharge from the dam reportedly reached around 2.5 lakh cusecs, which led to a substantial rise in the water level of the Sina River.

Due to the sudden and large discharge of water from the dam combined with heavy rainfall in the surrounding region, the river experienced severe flooding and strong water currents. The towers located near the river were submerged and exposed to high velocity water flow. The representative informed that the strong water currents caused erosion of soil around the tower foundations which resulted in weakening of the foundation. Due to the loss of foundation stability, five suspension

towers in the line collapsed. The representative further informed that restoration activities were undertaken subsequently to restore the transmission line and bring it back into service.

The failure details of the affected tower locations were reported as follows: At Tower Location No. 65, one side peak and one side top cross arm were found to be completely damaged, while the ground wire peak on the other side sustained minor damage. Tower Location No. 66 collapsed entirely due to heavy water flow, wherein floodwater carrying sugarcane crop residue and large tree debris got accumulated at the lower portion of the tower, resulting in excessive pressure on the bottom panels and subsequent structural failure. In the case of Tower Location No. 67, the collapse was attributed to heavy water flow, with two stubs remaining intact while the other two were completely bent, necessitating stub rectification prior to re-erection. Similarly, Tower Location No. 68 collapsed due to intense water flow originating from a nearby dam, with all four stubs found bent and requiring rectification at all legs. At Tower Location No. 69, damage was observed in one side of the bottom cross arm.

During the deliberations, Chief Engineer (PSE&TD), CEA enquired whether the affected towers were located directly in the river course or along the river bank. The representative of Adani Energy Solutions Limited clarified that the towers were located in the vicinity of the river and were affected due to severe flooding caused by the sudden release of water.

Chief Engineer (PSE&TD), CEA further asked whether any river protection or erosion control measures had been provided at the tower locations. The representative informed that the towers were designed based on the site conditions prevailing at the time of construction; however, the magnitude of flooding experienced during the incident was unusually high due to the large-scale release of water from the upstream dam.

Chief Engineer (PSE&TD), CEA also enquired whether the utility had analysed the hydrological conditions and the effect of upstream dam discharge while examining the tower failure. AESL representative informed that the failure investigation indicated that the flooding caused by heavy rainfall along with sudden discharge of water from Ujani Dam led to erosion of soil around the tower foundations. It was suggested that for all tower foundations in the areas prone to river flooding, suitable fencing in proper direction may be provided.

After detailed deliberations, the Committee observed that the tower failure occurred due to severe flooding in the Sina River caused by heavy rainfall and sudden release of water from the upstream Ujani Dam, which resulted in severe soil erosion around the tower foundations and collapse of five suspension towers.

5. The representative of **IndiGrid** presented the details of tower failure incidents pertaining to 01 No. of transmission line in which 05 Nos. of Towers failed (03 Nos. Suspension Towers and 02 Nos. Tension Towers) which were reported during the period July 2025 to December 2025. The transmission line tower failure deliberation are summarized below.

(vii) 400 kV D/C Jalandhar – Samba Transmission Line

The representative of IndiGrid informed that in the 400 kV D/C Jalandhar – Samba transmission line, a total of five towers failed during the incident, out of which three were suspension towers at location no. 234, 237 and 238 and two were tension towers at location no. 235 and 236. The incident occurred on 26.08.2025. It was informed that the transmission line was commissioned in the year 2018 and comprises approximately 358 towers with a total line length of about 134.8 km. The tower failure occurred in the vicinity of a river crossing where the tower foundations were located close to the river bank.

The representative explained that during the period of the incident, the region experienced heavy rainfall in the upstream areas of Himachal Pradesh and Jammu & Kashmir which resulted in sudden rise in water level of the Ravi river near the tower locations. The heavy rainfall in the upstream catchment areas caused significant flooding in the river, resulting in strong water currents. Due to the sudden increase in water flow and high velocity currents, erosion occurred around the tower foundations which weakened the soil support of the foundations. As the soil around the foundations was washed away, the stability of the towers was compromised which ultimately resulted in collapse of five towers in the line.

The representative further informed that due to continuous flooding in the area, access to the tower locations was initially difficult and inspection of the towers could only be carried out after the water level receded. Restoration activities were subsequently taken up to restore the transmission line.

The representative of IndiGrid also highlighted that on 10.10.2025, the 400 kV Parbati Pooling Banala (PG) – Koldam Transmission Line tripped due to dislodgement of conductor along with strain plate for the B-phase cross arm. . The line had initially encountered a tripping of similar nature on 11.09.2025 wherein it was observed that the area near tower no 42 had settled due to heavy rainfall from the period May 2025- Sep 2025. The line was then restored on 22.09.2025 lowing the sag, however, further settling of land was observed on 28.09.2025 and the same was intimated to NRPC and NRLDC.

During the deliberations, Chief Engineer (PSE&TD), CEA enquired whether the affected towers were located in the river course or near the river bank. The representative of IndiGrid clarified that the towers were located near the river and were affected due to flooding and erosion caused by the sudden increase in water level.

Chief Engineer (PSE&TD), CEA further asked whether any protective measures had been provided around the tower foundations to prevent erosion. The representative informed that the towers had been designed as per the prevailing site conditions; however, the flooding caused by heavy rainfall in the upstream regions resulted in significant erosion around the foundations. Chief Engineer (PSE&TD), CEA also enquired about the restoration of the transmission line following the incident. The representative informed that restoration work was undertaken after the flood water receded and necessary measures were taken to bring the line back into service.

Chief Engineer (PSE&TD), CEA stated that restoration towers should be based on latest codal provisions and soil assessment should be done for the towers placed near river/dam and which is subjected to flood.

It was noted that site visit for the subject event was undertaken by the standing committee on 27.12.2025. As per their report, it was noted that there was no ambiguity in the erection and maintenance of the failed towers. No missing member and nut-bolts were there. A new water course was created due to high floods & change of river course. The foundation of tower could not withstand against scouring effect/action of the river and transmission lines had failed due to the change in the river course. From above, it is imperative that the occurrence of tower collapse is due to the severe flooding causing widening of the Ravi River and thereby eroding the soil beneath the tower foundation leading to collapse of the Transmission tower. Further, it was also observed that such widening of river of up to 2 kms from its original course as well as the soil erosion to extent of 4-5 meters was unprecedented seeing the history of river and it can be said that this incident was beyond the control of any agency operating in that region.

After detailed deliberations, the Committee observed that the tower failure occurred due to heavy flooding of the Ravi River caused by heavy rainfall in the upstream regions, which resulted in soil erosion around the tower foundations and collapse of five towers in the transmission line.

5. Statistics and Analysis of the EHV Transmission Line Tower failure:

5.1 General Statistics of Reported EHV Transmission Line Tower Failures:

- a) Failure of 17 Nos. of EHV Transmission Line Towers in 07 Nos. Transmission Lines of voltage class of 220 kV, 400 kV and 765 kV AC have been reported to CEA during the period of July, 2025 to December, 2025. The total 07 Nos. of EHV Transmission Lines failure are mentioned in the Table 1 given below:

Table 1: Details of failure of EHV Transmission Lines

S.N.	Name of the Transmission Line	Name of Utility	Date of Failure	Year of Commissioning	Wind Zone	No. of Towers Failed			Conductor or
						Suspension	Tension	Total	
1.	765 kV S/C Koteshwar Meerut transmission line	PGCIL	11.08.2025	2001	4	0	2	2	ACSR BERSIMIS (Quad)
2.	400 kV Chamera II – Chamera I Transmission Line	PGCIL	26.08.2025	2013	2	0	1	1	ACSR MOOSE (Twin)

3.	400 kV Chamera II – Kishenpur Transmission Line	PGCIL	06.09.2025	2019	Medium as per IS 802 1977	0	1	1	ACSR MOOSE (Twin)
4.	765 kV S/C Lucknow - Bareilly Line	PGCIL	03.09.2025	2019	4	1	1	2	ACSR BERSIMIS (Quad)
5.	220 kV Shivelakha - PS2 Line / 220kV Shivelakha - Sankhari Line	GETCO	08.09.2025	2012	-	1	0	1	ACSR Zebra
6.	400 kV Solapur-Kolhapur (CKT-2) & 400KV Solapur-Alkud (CKT-1) Transmission Line	Adani	25.09.2025	2014	2	5	0	5	ACSR Moose (Twin)
7.	400 kV D/C JALANDHAR(PG)-SAMBA(PG) (NRSS XXIX) Line	IndiGrid	26.08.2025	2004	4	3	2	5	ACSR Moose (Twin)
Total						10	07	17	

b) The total number of incidences of failures of EHV Transmission Line Towers, and the Nos. of affected Tension type and Suspension type towers that have been reported to CEA for the period of January, 2025 to June, 2025 are indicated in the Fig. 1 given below.

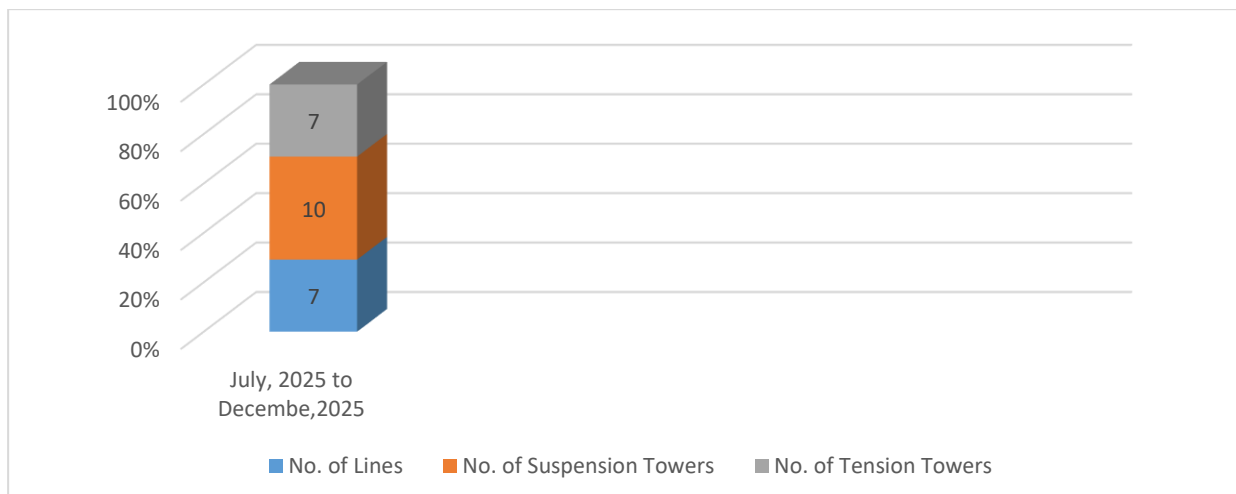


Fig. 1

- c) The number of failed Suspension and Tension type towers at various voltage levels, reported for the period of July, 2025 to December, 2025 are indicated in Table-2 below:

Table 2: Voltage wise Tower failure

Voltage Level	Utility	No of affected line	No of Tower failed					
			Suspension tower	Tension Tower				Total no of Tower
				A	B	C	D	
765 kV	PGCIL	2	1		1	2	3	4
	Total	2	1		1	2	3	4
400 kV	PGCIL	2			1	1	2	2
	ADANI	1	5					5
	Indigrid	1	3	1		1	2	5
	Total	4	8	1	1	2	4	12
220 kV	GETCO	1	1					1
	Total	1	1					1
Total		7	10	1	2	4	7	17

- d) It can be seen from the below **Fig. 2** that at 765 kV Voltage level, 1 Nos. of Suspension type tower and 03 Nos. of Tension Type towers were failed in 02 No. of Transmission Line, at 400 kV Voltage level 08 Nos. of Suspension type tower and 04 Nos. of Tension type towers have failed in 04 Nos. of Transmission Line, and at 220 kV Voltage level 01 No. of Suspension type tower was failed in 1 No. of Transmission Line.

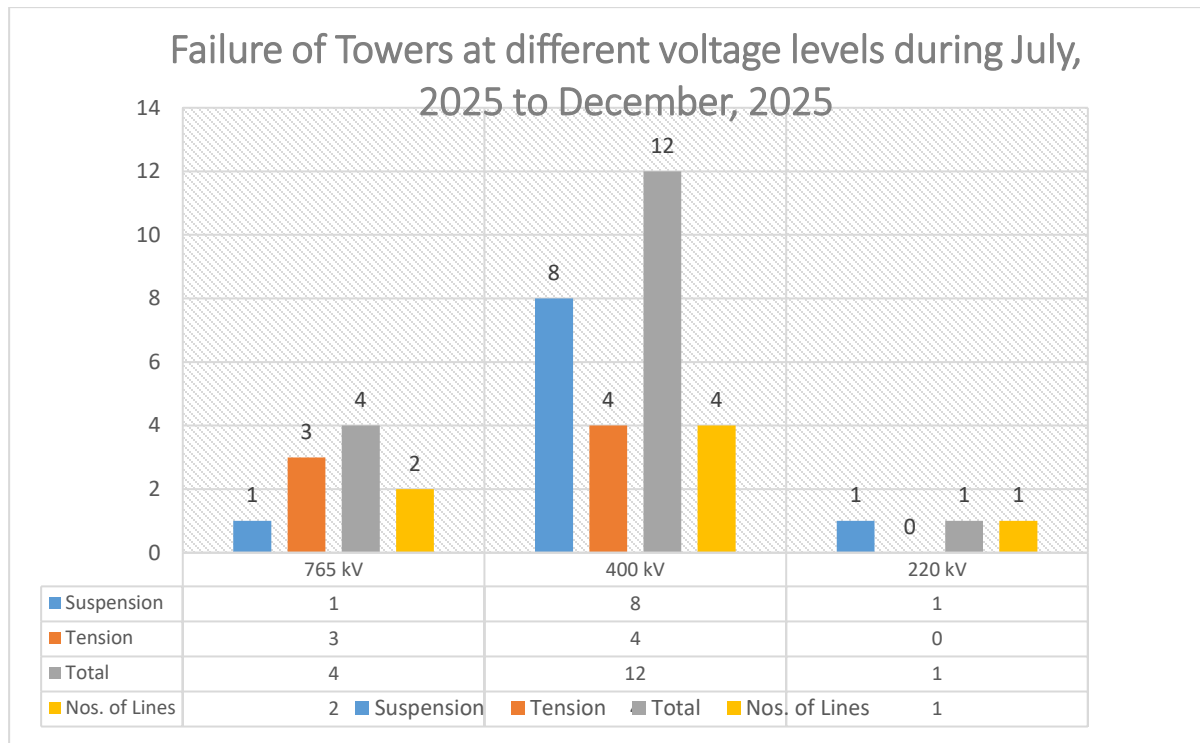


Fig. 2

e) It can be seen from the below **Fig. 3** that out of total 17 Nos. of EHV Line Tower failure, 10 Nos. are of Suspension type tower leading to its share of 59 % of total towers failed and 07 Nos. are of Tension type towers leading to its share of 41 % of total towers failed. Out of total 07 Nos. of Tension Type tower, 01 No. are of Type B, 02 Nos are of Type C and 4 Nos. are of Type D Tension tower.

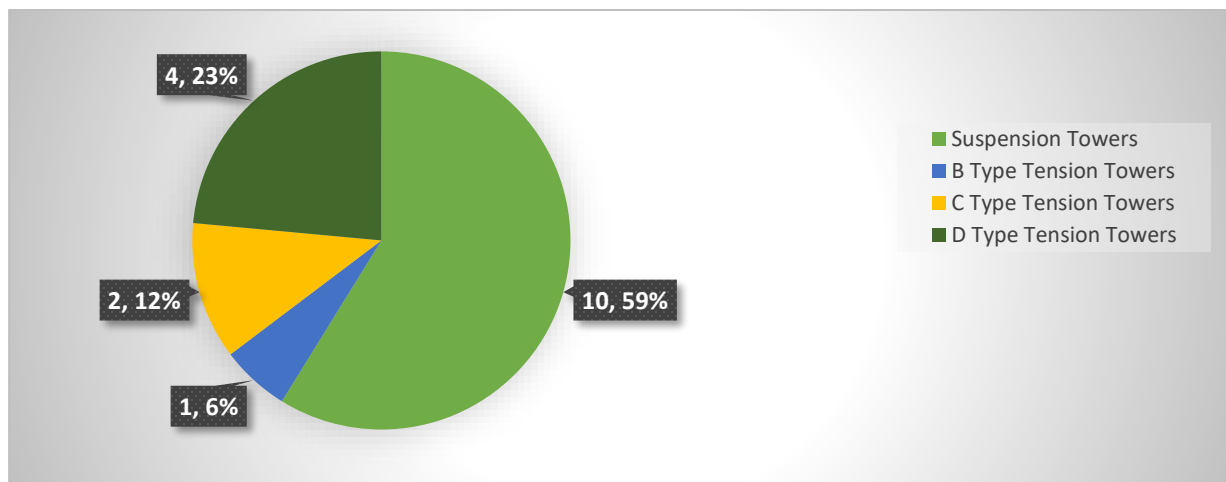


Fig. 3

f) It has been observed that the failure rate of Suspension type tower is higher in comparison to Tension type tower. This may be because in normal terrain, generally, the nos. of Suspension type tower in any particular line is much higher than that of Tension type tower. Further, the Suspension type towers are not designed to take horizontal forces in the longitudinal direction and hence the

failures of one suspension type tower cause secondary failure of adjacent Suspension towers due to the pulling force of conductors. In view of above, the loading criteria for the Suspension type towers have been made more stringent and the longitudinal and transverse force acting on Suspension type towers under security condition has been increased in revised IS 802: 2015.

- g) The wind map of India was divided into three wind pressure zones that is light, medium & heavy, before the revision of IS 802 in 1995. In the third revision of IS 802: 1995, 6 wind zones were specified dividing various regions on the basis of 3 second wind gust speed. The No. of transmission lines and towers, failed during the period from July, 2025 to December, 2025 and designed according to various wind zones is given in **Fig. 4** below. It can be seen that the maximum no. of failure of towers have occurred for transmission lines which were designed for 4. It may be noted that maximum area of India is covered under the wind zones 2 and 4.

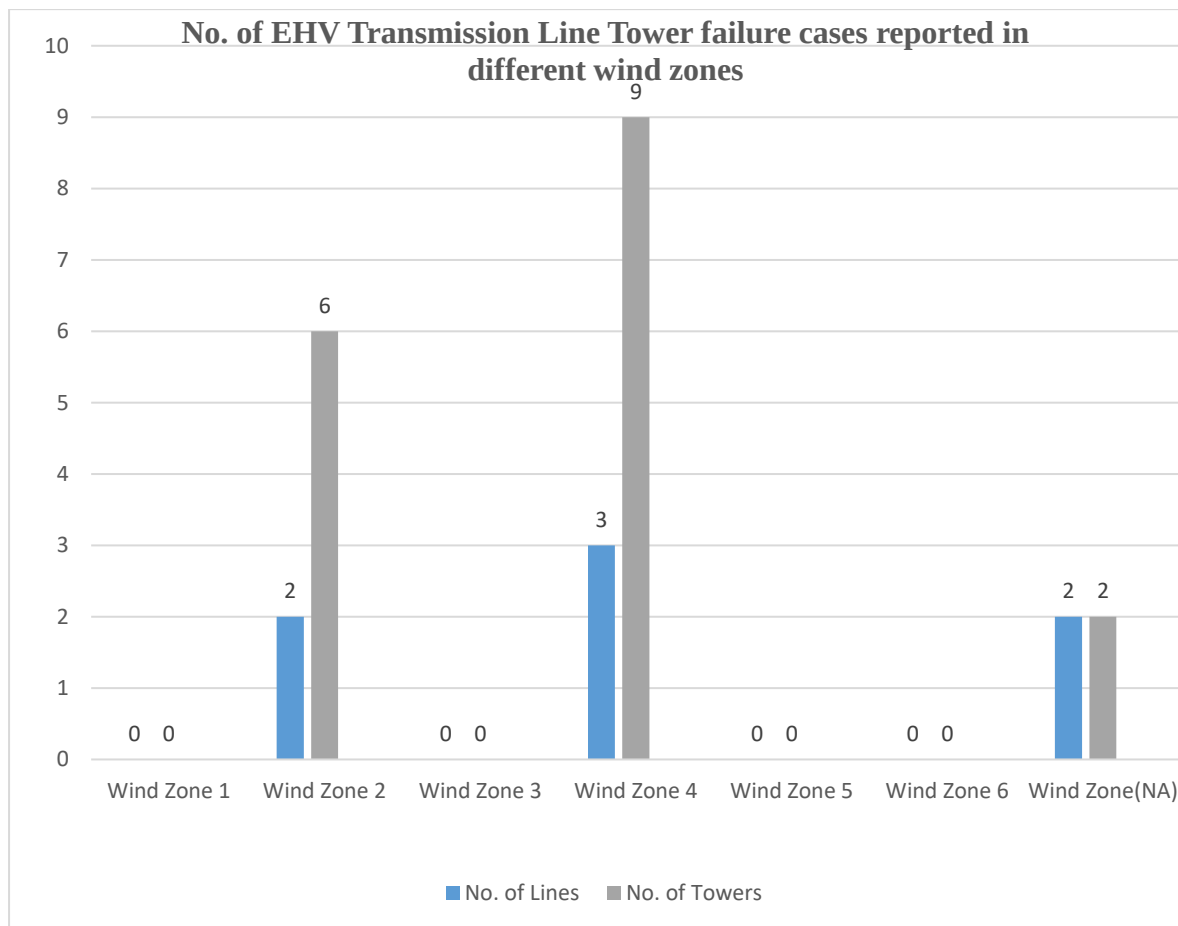


Fig. 4

5.2 Insights into Tower Failure Incidents during Past Years:

- a) The details of previous EHV Transmission Line Tower failure incidents which were reported to CEA and have been discussed in the past Standing Committee meetings from the year 2014 onwards have been analysed by CEA and the graph depicting the failures of EHV Transmission Line towers occurred during past years (2014-2025) that have been discussed in the previous Standing committee meetings are shown below in **Fig. 5**. The maximum No. of failures, i.e., 163 cases of tower failures occurred during year 2014. As has been observed in the previous Standing Committee meetings, the failure rate of suspension towers is much higher in comparison to tension towers. This may be because of the cascading effect of failure of suspension type towers i.e. secondary failure of adjacent suspension towers due to the pulling force of conductors which have been developed due to failure of another tower.

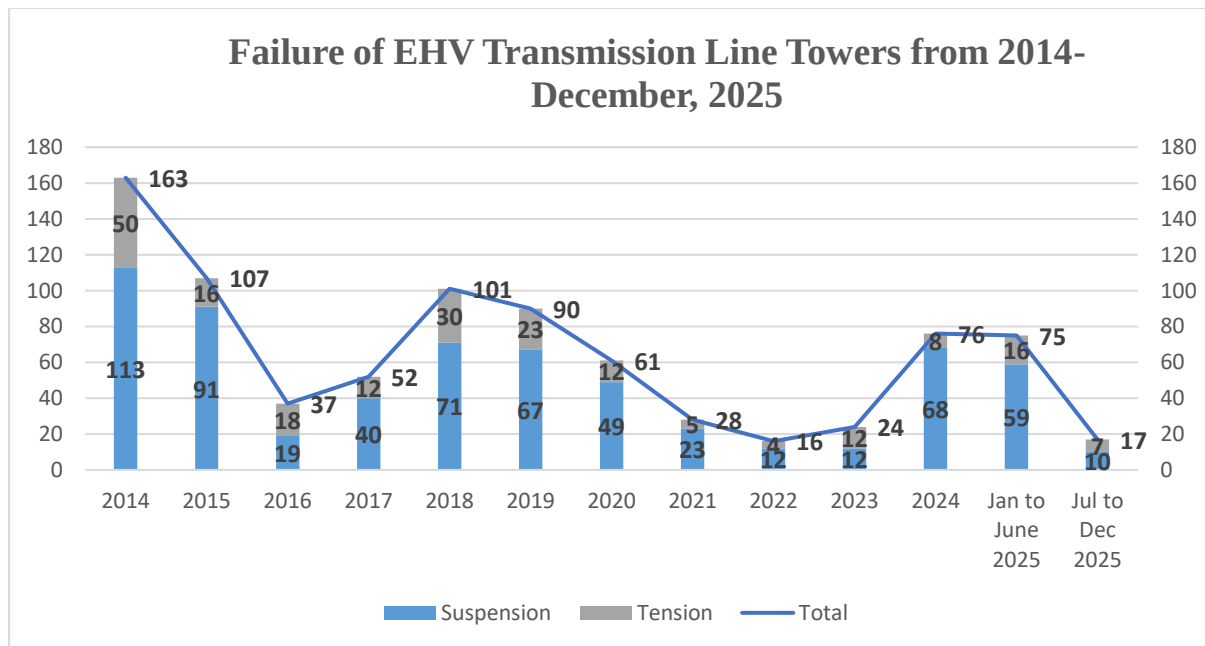


Fig. 5

- b) The graph depicting the failures of towers at various voltage levels that have occurred in past years (2012-2025) and intimated to CEA which have been discussed in the Standing committee meetings are shown below in Fig. 6. It may be observed that towers of 400 kV voltage level have maximum incidents of failure. It may be noted that the mandate of the Standing Committee is to investigate failure of towers of 220 kV and above voltage class transmission line and the graph shows the details of only those transmission line failures which have been intimated to CEA.

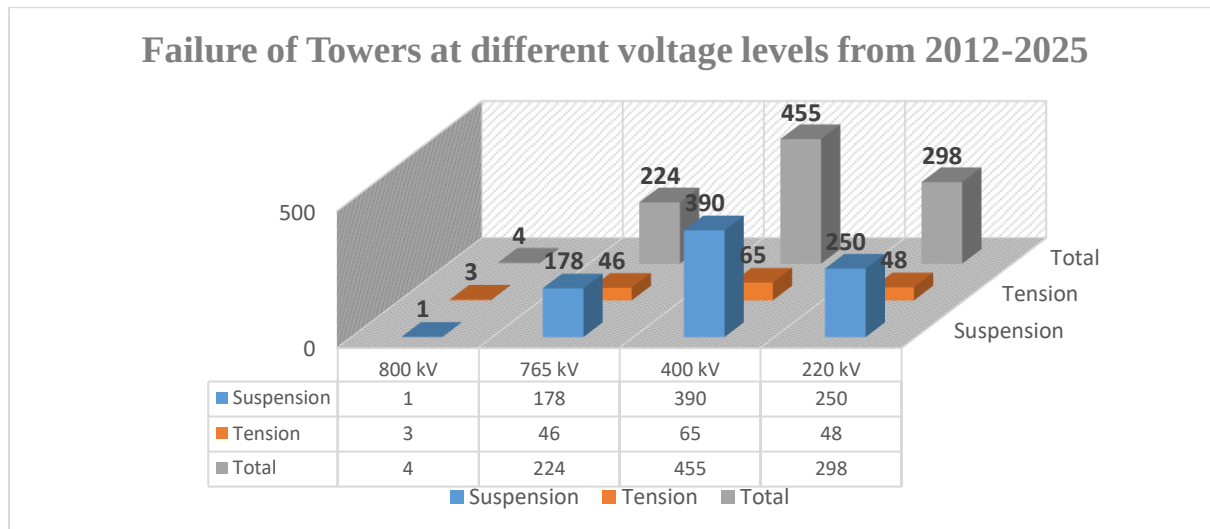


Fig. 6

6. General Observations of the Standing Committee

- a) The type of failures of EHV Transmission Line Towers of various voltage levels can be broadly classified as under:
- Deformation in legs of towers and cage portion of bottom cross arm level.
 - Buckling at stub level leading to complete collapse of towers with/without damage to tower foundation.
 - Buckling above 1st panel (normal tower) level with/ without damage to tower foundation.
 - Buckling from bottom cross arm level or top cross arm level or peak broken without any damage to lower portion of the tower and foundation.
 - Damage to foundation as well as to tower structure due to increased water level and additional force due to water flow/velocity in the river/soil erosion and inadequate protection to foundation of towers.
 - Shearing of stubs of leg members of towers.
- b) The main cause of tower failures is attributed to high intensity wind and heavy water discharge or flood as reported by the transmission utilities, however the utilities failed to produce wind data and water discharge data in many cases of EHV Transmission Line Tower failures which could substantiate their reasoning. The transmission utilities are unable to produce the actual real time wind speed data on the day of failures due to non-availability of wind speed data at the failure location. The standing committee observed that wherever reporting of tower failure is due to wind, the utility needs to get the wind data for the area from the IMD observatory/ nearby Airport/ nearest wind farms, or the State Irrigation Department which would serve as representative wind

speed prevailing in that area at the time of failure. It was agreed that the high wind velocity during storm and local condition of whirl wind might have exceeded the design wind speed for which the tower is designed; however, this needs to be verified. Assistance of IMD & other agencies involved in metrological field may be taken by the affected utilities in this regard and utilities may request for sharing of the wind data obtained from Observatory/Satellite/ Radar.

- c) The structural integrity of transmission towers depends on many factors including adequacy of technical standard/ stipulated codal requirement considered for designing the transmission tower, quality of material grade used in tower body, Construction methodology, workmanship and erection practices, Operations & Maintenance practices of the transmission utilities etc.
- d) Over the years, Indian Standards for design of transmission line tower has undergone changes. As revision of codal provisions is a continuous process, the changes are to be implemented prospectively. Strengthening of towers of existing transmission lines due to change in the codal provisions could be decided on case to case basis, if repeated failures are observed in a particular line. **The Committee observed that the tower erected after restoration should be based on latest codal provisions /technical standards. And Spare towers which the Utilities procure also should conform to latest codal provisions /technical standards.**

7. General recommendations and remedial measures suggested by the Committee:

The recommendations and remedial measures suggested by the Committee after detailed deliberations are given under:

- a) Apart from intimating incidents of tower failures and furnishing detailed Report in stipulated format as per Regulation 48 (8) of CEA (Measures relating to Safety and Electric Supply) Regulations, 2023, concerned utilities shall furnish a closure report for the event within 3 months including all the details and records. All utilities are requested to adhere to these timelines strictly.
- b) Digitization of Spares and Inventory Management of transmission system assets using suitable software like SAP shall be taken up on priority basis.
- c) Recommendations of the Task Force on Cyclone Resilient Robust Electricity Transmission and Distribution (T&D) Infrastructure in Coastal area [Report brought out in May, 2021) shall be considered for appropriate adoption by the Utilities concerned.
- d) All utilities to develop in-house teams equipped with relevant tower design software to simulate, analyze, and address design issues in failed towers.
- e) It has been observed that wind intensity has changed in certain parts of the country due to climate change. In response, the wind map was revised by SERC in 2016 and incorporated into the National Building Code (NBC) by BIS. However, the revised wind map has yet not been



included in IS 875. SERC, in coordination with IMD, has been requested to update the wind map. Until IS 875 is formally revised, utilities are advised to refer to the wind map provided in the National Building Code for the design of towers.

- f) After every failure, the concerned utility needs to submit the actual wind velocity prevailed in the affected area so that the Investigating Team of Standing Committee could get reference wind speed prevailed over that area. In this matter, the respective utility may seek the help of IMD/ nearest Airport/ nearest wind farms, or the State Irrigation Department to estimate the wind speed in affected area based on data obtained from observatory/ Satellite/Radar.
- g) The towers which were designed based on old standards should be checked and strengthened based on latest standards.
- h) For Towers having special design with high extensions and having powerline crossing (single or multiple) beneath it, the Committee recommended to increase the reliability level to ensure greater structural stability. It was also suggested that CPRI may be consulted to validate this approach.
- i) The Committee further emphasized that in RFPs, the reliability level should be specified for power line crossings.
- j) For towers located in overlapping wind zones, the Committee recommended that higher wind zone shall be considered if the tower is situated within 50 km of the border area, and the Tower may be designed accordingly.
- k) Due to climatic change, incidents of high winds are increasing. Transmission Utilities need to take proactive measures such as increased line patrolling, immediate replacement of missing members/bolts. Various deficiencies such as missing members, missing bolts, bent members, incorrect attachment of cross arm, chimney covered with soil, rusted stub/members etc. has been observed during the failure site visit of various transmission towers of different utilities. These deficiencies may be attributed to poor workmanship, erection deficiency, O&M issues etc. Utilities shall take necessary precautions and carry out proper maintenance of their lines so as to avoid failure of towers due to such deficiencies.
- l) Pile type foundation shall be used for towers located in river or creek bed or on bank of river having scourable strata or in areas where river flow or change in river course is anticipated, based on detailed soil investigation and previous years' maximum flood discharge of the river, maximum velocity of water, highest flood level, scour depth and anticipated change in courser of river based on river morphology data of at least past 20 years to ensure availability and reliability of the transmission line.



- m) The transmission towers erected near river banks should be frequently patrolled and assessment based on history should be made to anticipate the change in course of river and necessary protection should be provided to towers to avoid its damage during such incident.
- n) In case of damage of foundation of towers, the foundation design is required to be examined.
- o) The material test report of failed towers should be examined to ascertain the quality of the material.
- p) Committee suggested to clear the encroachment in the ROW of the line. Committee advised that utilities should improve their erection, patrolling and operation and maintenance practices.
- q) Regular patrolling of the lines is required for smooth and trouble-free operation of line. During patrolling any unauthorized construction/use/ storage under and around the towers should also be checked and if such activity is observed, local administrative authority should be immediately informed for assistance and necessary action.
- r) In case of towers located in flood prone area the detail soil investigation study should be carried out for realistic assessment of soil erosion control.

Annexure-I: List of Participants

CEA

1. Sh. N.R.L.K Prasad Chief Engineer PSE&TD (CEA)
2. Sh. Kavita Jha, Director PSE&TD
3. Sh. Ashish Kumar Lohiya, Dy. Director (PSE&TD)
4. Smt. Jyoti Singh, Deputy Director (PSE&TD)
5. Sh. Amrendra Pratap Singh, Assistant Director (PSE&TD)
6. Smt. Rashmi, Assistant Director (PSE&TD)

CPRI

1. Sh. Dr. M. Selvaraj, Additional Director

CSIR

1. Dr. R.P. Rokade, Scientist-F
2. Dr. P. Hari Krishana, Scientist-G

ADANI

1. Sh. Saurabh, DGM
2. Sh. Saurabh Sharma, Dy. Manager
3. Sh. Rajat Bajpai, Manager

POWERGRID

1. Sh. Indra Singh Rouriya, DGM
2. Smt. Tunisha Soni, DGM
3. Sh. D. Nikhadia, Sr. GM

IDIGRID

1. Sh. Lokendra Singh Ranawat, Head Regulatory
2. Sh. Abhishek Kukreja, DGM

PSTCL

1. Sh. Akshay Kumar, Addl. E

DVC

1. Sh. Rabin Mandal, GM (Transmission)
2. Bipin Kumar Jha, Sr. Manager

MPPTCL

1. Sh. Ravendra Patel, Executive Engineer

NHPC

1. Sh. Mithilesh Prasad Dinkar, Ground General Manager
2. Keshav Kishore Jha, Senior Manager

BBMB

1. Sh. Aman Dahiya, Executive Engineer
2. Sh. Vijay Kamal, Assistant Engineer

NRPC

1. Sh. Reeturaj Pandey, EE (Prot.)
2. Sh. Akash Jain, AE (Prot)

IMD

1. Dr. Trisanu Banik, Sc-D

Annexure-II: Detailed information of EHV Transmission Line Tower Failure cases as reported by Various Transmission Utilities

1. POWERGRID

The following Transmission Lines Towers of POWERGRID had failed during January, 2025 to June, 2025:

Sl. No.	Name of the Transmission Line	Name of Utility	Date of Failure	Year of Commissioning	Wind Zone	No. of Towers Failed			Conductor
						Suspension	Tension	Total	
1.	765 kV S/C Koteswar Meerut transmission line	PGCIL	11.08.2025	2001	4	0	2	2	ACSR BERSIMIS
2.	400 kV Chamera II – Chamera I Transmission Line	PGCIL	26.08.2025	2013	2	0	1	1	ACSR MOOSE
3.	400 kV Chamera II – Kishenpur Transmission Line	PGCIL	06.09.2025	2019	Medium as per IS 802 1977	0	1	1	ACSR MOOSE
4.	765 kV S/C Lucknow - Bareilly Line	PGCIL	03.09.2025	2019	4	1	1	2	ACSR BERSIMIS

DETAILS IN RESPECT OF EACH TRANSMISSION LINE

1. 765 kV S/C (Quad Bersimis) Koteswar-Meerut Ckt-I

Sl. No.	Details	Remarks
1.	Name of Transmission line with voltage level:	765 kV S/C (Quad Bersimis) Koteswar-Meerut Ckt-I
2.	Date and time of occurrence/discovery of failure:	11.08.2025, 15:59
3.	Length of line (km):	179.27
4.	Type of configuration: [(S/C, D/C, M/C, S/C strung on D/C towers, narrow base etc.)]	Single Circuit
5.	Number of Towers and Type of Towers failed: [Suspension/ tension/dead end/special tower /river crossing tower/ Power line crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	2 (Two) DK+9 TP Tower and C+25 Tower
6.	Tower location No. with reference to nearest substation(indicate Name):	Tower Loc. No. 141 & 142 from Koteswar S/
7.	Name and size of conductor:	ACSR BERSIMIS, AL 42/4.57+ST 7/2.54 mm
8.	No. of sub-conductors per bundle and bundle spacing:	4 sub-conductors Bundle Spacing: 457 mm
9.	Number and size of Ground wire/OPGW (if provided):	2, 7/3.66, Size 10.98
10.	Type of insulators in use(Porcelain / Glass / Polymer):	Porcelain disc insulators
11.	Configuration of insulators (I / V / Y / tension):	V-Suspension
12.	No. of insulators per string and No. of strings per phase:	140 Insulators/ String and 4 String/phase
13.	Year of construction / commissioning:	2001
14.	Executing Agency:	KEC
15.	Weather condition on the date of failure:	Rainy
16.	Terrain Category:	River bank and reserve forest
17.	Reliability Level:	Reliability Level - 2
18.	Wind Zone (1/2/3/4/5/6) and velocity of wind:	WZ- 4
19.	Details of earthing of tower (pipe type/ Counter poise):	Counter poise
20.	Line designed as per IS:802 (1977/1995/2015 any other code):	1995
21.	The agency who designed the line:	M/s. KEC
22.	Any Special consideration in design:	No
23.	Details of last maintenance activity along with date:	Last Patrolling Date Loc. 141: 28.04.2025 Loc. 142: 08.08.2025
24.	Power flow in the line prior to failure:	475MW
25.	Any missing member found before / after failure of towers:	No
26.	Condition of foundation after failure:	i) Loc. No. 141: Pile Foundation Ok. However, all four stubs damaged ii) Loc. No. 142 (FS foundation): D-Leg collapsed. All stubs bend.
27.	Brief Description of failure: [Along with photographs (if available), other related	Flash Flood, change of course of Song River, eroded of soil under tower foundation. Further the huge debris with uprooted trees struck the tower bottom

	information like tower schedule, newspaper clipping for cyclone / wind storm etc.]	section resulting in its collapse by high water current
28.	Probable cause of failure:	Due to a flash flood and the subsequent change in the course of the Song River, the soil beneath the foundation of Tower No. 142 was severely eroded. Further the huge debris with uprooted trees struck the tower resulting in its collapse. As a consequence, Tower No. 141 also collapsed, and the earth peaks of Towers No. 140 and 143 sustained damage
29.	Details of previous failure of the line / tower :	NIL
30.	Whether line will be restored on ERS or Spare tower will be used:	1 number ERS towers will be erected for temporary restoration of the line.
31.	Likely date of restoration:	31.08.2025 (Through ERS
32.	Present Status:	Gang mobilized at site for erection of tower no 141(TP) & ERS towers
33.	Details of any Tests carried out after failure(attach test reports):	Samples collected and shall be sent to NABL accredited Lab for testing.
34.	Wind speed data of date & time of failure from nearby authorized observatory:	Not applicable
35.	Location of failed tower a. Location Coordinates: b. Nearest Airport: c. District and State:	TN 141-30.060874, 78.203128 TN 142-30.057501, 78.204529 Jolly Grant Airport, Dehradun, Uttarakhand
36.	Single line diagram/clearance diagram of failed tower(s) with all dimensions (horizontal & vertical dimensions including base width of tower)	-
37.	Tower weight:	141 TP (DK+9)- 33 Ton, 142 C+25- 45.5 Ton
38.	Tower spotting data:	Attached
39.	Tower schedule of affected section:	Attached
40.	Sag tension calculation considered for design of tower:	Indicated in Tower spotting data
41.	Design document of failed towers:	Tower drawing attached
42.	Any other relevant information:	

2. 400 kV Chamera II – Chamera I transmission line

Sl. No.	Details	Remarks
1.	Name of Transmission line with voltage level:	400 kV Chamera II – Chamera I transmission line
2.	Date and time of occurrence/discovery of failure:	Line manually opened by Chamera 2 NHPC at 1235 hrs / 26.08.2025 keeping in view flash floods in Ravi River (as the tower is in clear line of sight from Chamera I S/S) and subsequently Tower No 78 washed away at 1330 Hrs /26.08.2025 due to above flash floods in the river
3.	Length of line (km):	35.416 kms
4.	Type of configuration: (S/C, D/C, S/C strung on D/C towers, narrow base etc.)	D/C (Dead-end design tower)
5.	Number of Towers and Type of Towers failed: [suspension / tension/dead end /special tower /river crossing tower/ Powerline crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	01 no. of Tension Type Tower at loc no. 78 (DD+0)
6.	Tower location No. with reference to nearest substation (indicate Name):	Tower No. 78 (Sequence from Chamera II end and nearest to Chamera I S/S)
7.	Name and size of conductor:	MOOSE, Nominal Diameter: 31.77 mm
8.	No. of sub-conductors per bundle and bundle spacing:	Twin with bundle spacing of 45.7 cm
9.	Number and size of Ground wire/OPGW (if provided):	- Earth-wire is 3.66 mm strand dia. and 10.98 mm nominal dia. - OPGW is 24 strand/12mm nominal dia.
10.	Type of insulators in use (Porcelain / Glass / Polymer):	Porcelain discs
11.	Configuration of insulators (I / V / Y / tension)	Vertical configuration D/C Tension tower with each insulator string using “DT” string
12.	No. of insulators per string and No. of strings per phase:	“Double Tension” string having two pairs of 25 nos. of 160 kN porcelain discs
13.	Year of construction / commissioning:	Originally, there was a Single Circuit horizontal configuration direct transmission line from Chamera I (NHPC) to Kishenpur SS (POWERGRID) which was LILOed at Chamera II on 01.07.2003 and consequently, the 400 kV Chamera I – Chamera II transmission line came into being. Above LILO of the parent line at Chamera I HEP has been done by double circuit vertical configuration Tower Nos. 77, 78 and 79
14.	Executing Agency:	M/s L&T
15.	Weather condition on the date of failure:	It had been raining unprecedently heavily since 26.08.2025 in almost all the North Indian states (viz. JK, Punjab, Himachal, Ladakh etc). IMD predicted a grim picture viz. flash floods on 26.08.2025 and 27.08.2025. As per IMD report for August 2025, Himachal Pradesh received the highest August rainfall since 1949

Sl. No.	Details	Remarks		
		which has been quantified as 561.6 mm in Chamba Region against normal average of 291.7 mm.		
16.	Terrain Category:	Tough hilly terrain with tower situated in junction of River Ravi and River Sewa (one of the major tributaries of River Ravi) in Village Hat Mashka Tehsil Basohli J&K (last village of J&K on HP-JK boundary) in Chamba range of hills.		
17.	Reliability Level			
18.	Wind Zone & Velocity of wind	Wind Zone-2 as per IS 802 1995		
19.	Details of Earthing of Towers	Counter Poise Earthing		
20.	Line designed as per IS: 802 (1977/1995/2015/any other code):	IS 802 1995		
21.	The agency who designed the line			
22.	Any Special consideration in design:	No		
23.	Details of last maintenance activity along with date	No major maintenance carried out on this tower. However, tower was last patrolled on 04 th August 2025. No major abnormality found during the said patrolling.		
24.	Power flow in the line prior to failure:	Since line was already hand tripped by NHPC before collapsed of the tower, therefore there was no power flow at the time of failure of thew line		
25.	Any missing member found before / after failure of towers:	No missing member noticed		
26.	Condition of foundation after failure:	Whole foundation along with base soil washed away by flash floods		
27.	Brief Description of failure: [along with photographs (if available), other related information like tower schedule, newspaper clipping for cyclone / wind-storm etc.]	Tower has collapsed at location no. 78 due to excessive soil erosion owing to the flash floods caused by unprecedented rainfall/ cloud burst events on upstream side of River Ravi/ Sewa. The same is also evident from the IMD reports and widespread devastation in nearby areas as reported by local media		
28.	Probable cause of failure:	Flash floods in adjoining river due to unprecedented rainfall/ cloud burst events on upstream side of River Ravi/ Sewa		
29.	Details of previous failure of the line / tower	No failure history		
30.	Whether line will be restored on ERS or Spare tower will be used:	Line was restored using temporary provisions.		
31.	Likely date of restoration:	Line restored using temporary provisions at 2011 hrs on 08.09.2025		
32.	Present Status:	Measures being undertaken for permanent restoration		
33.	Details of any Tests carried out after failure	Visual Inspection and material testing		
34.	Wind speed data of date and time of failure from nearby authorized observatory	Not applicable		
35.	Location of failed tower a) Location coordinates b) Nearest Airport c) District & State	<table><tr><td>75.914491</td><td>32.615246</td></tr></table> Dharamshala Chamba, Himachal Pradesh	75.914491	32.615246
75.914491	32.615246			

Sl. No.	Details	Remarks					
36.	Single line diagram / clearance diagram of the failed tower(s) with all dimensions (Horizontal and vertical dimensions including the base width of tower)						
37.	Tower Weight	32.46MT					
38.	Tower spotting data	Attached					
39.	Tower Schedule for the failed section		Tower No	Type of Tower	Span Length	Angle of Deviation	Cum. Length (M) From Kishenpur
			77	DD+0		50°30'00"LT	34757
					74		
			78	DD+0		48°27'00"RT	34831
					326		
			283	SD+0		12°18'00"RT	35157
40.	Sag tension calculation considered for the design of towers						
41.	Design Document of failed tower	Attached.					
42.	Any other relevant information						
43.	Flood Data	Flood Data for 26.08.2025 (as provided by Sewa Admin setup which is located adjacent to tower no 78) Velocity - 9.56 m/sec Discharge - 2391.58 Cusecs High Flood Level - 1197.50 mtr. (mail from Sewa NHPC is attached herewith as Annexure-Flood Data)					

3. 400 kV Chamera II – Kishenpur transmission line

Sl. No.	Details	Remarks
1.	Name of Transmission line with voltage level	400 kV Chamera II – Kishenpur transmission line
2.	Date and time of occurrence/discovery of failure:	0544 hrs./06.09.2025 and discovery of failure immediately after failure
3.	Length of line (km):	134.810 kms
4.	Type of configuration: (S/C, D/C, S/C strung on D/C towers, narrow base etc.)	D/C
5.	Number of Towers and Type of Towers failed: [suspension / tension/dead end /special tower /river crossing tower/ Powerline crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	01 no. of Tension Type Tower at loc no. 238 (SC+9)
6.	Tower location No. with reference to nearest substation(indicate Name):	Tower No. 238 (Sequence from Kishenpur end and nearest to Chamera II S/S)
7.	Name and size of conductor:	MOOSE, Nominal Diameter: 31.77 mm
8.	No. of sub-conductors per bundle and bundle spacing:	Twin with bundle spacing of 45.7 cm
9.	Number and size of Ground wire/OPGW (if provided):	- Earth-wire is 3.66 mm strand dia. and 10.98 mm nominal dia. - OPGW is 24 strand/12mm nominal dia.
10.	Type of insulators in use (Porcelain / Glass / Polymer):	Porcelain discs
11.	Configuration of insulators (I / V / Y / tension)	Horizontal configuration S/C Tension tower with each insulator string using “DT” string
12.	No. of insulators per string and No. of strings per phase:	“Double Tension” string having two pairs of 25 nos. of 160 kN porcelain discs
13.	Year of construction / commissioning:	Originally, Single Circuit horizontal configuration direct transmission line from Chamera I (NHPC) to Kishenpur SS (POWERGRID) commissioned on 01.10.1997 which was LILoed at Chamera II on 01.07.2003 and consequently, the 400 kV Chamera II - Kishenpur transmission line came into being.
14.	Executing Agency:	M/s Birla GTME
15.	Weather condition on the date of failure:	Raining heavily since last two weeks. Conditions detailed in the investigation committee report
16.	Terrain Category:	Tough hilly terrain with tower situated in village Bharmar Gala in Basohli (J&K)
17.	Reliability Level	Not Applicable

Sl. No.	Details	Remarks
18.	Wind Zone (1/2/3/4/5/6) and velocity of wind for which tower was designed:	Wind Zone-Medium as per IS 802 1977
19.	Details of Earthing of Tower	Counter-Poise Earthing
20.	Line designed as per IS: 802 (1977/1995/2015/any other code):	IS 802 1977
21.	The agency who designed the line:	
22.	Any Special consideration in design:	No
23.	Details of last maintenance activity along with date	No major maintenance carried out on this tower. However, tower was last patrolled on 28 th August 2025. No abnormality found during the said patrolling.
24.	Power flow in the line prior to failure:	At 2120 hours on 25.04.2024, Circuit III & IV taken under S/D for precautionary purpose (near habitations) on directions of the District Admin as the land sinking was observed in the area
25.	Any missing member found before / after failure of towers:	No missing member noticed
26.	Condition of foundation after failure:	Tower has collapsed at location no. 238 due to excessive land settlement owing to the unprecedented and record-breaking rainfall. The same is also evident from the IMD reports and widespread devastation in nearby areas as reported by local media
27.	Brief Description of failure: [along with photographs (if available), other related information like tower schedule, newspaper clipping for cyclone / wind-storm etc.]	Tower has collapsed at location no. 238 due to excessive land settlement owing to the unprecedented and record-breaking rainfall. The same is also evident from the IMD reports and widespread devastation in nearby areas as reported by local media
28.	Probable cause of failure:	Mass land sinkage around tower no. 238
29.	Details of previous failure of the line / tower	Tower No. 238 collapsed on 01-09-2018 due to high-speed wind
30.	Whether line will be restored on ERS or Spare tower will be used:	Line was restored using ERS at 2210 hrs on 18.09.2025
31.	Likely date of restoration:	Line temporarily restored using ERS on 18.09.2025 Permanent restoration by Jun.' 26
32.	Present Status:	Given the mass sliding, the line was restored using ERS on 18.09.2025. Diversion of line is being carried out to permanently restore the line
33.	Details of any Tests carried out after failure:	Visual Inspection and material testing
34.	Wind speed data of date & time of failure from nearby authorized observatory	Not Available - As the tower failure happened due to land sinking on account of heavy rainfall.
35.	Location of failed tower: a) Location Coordinates	5.7974168 32.5391981

Sl. No.	Details	Remarks				
	b) Nearest Airport c) District & State	Dharamshala Chamba, Himachal Pradesh				
36.	Single line diagram / clearance diagram of the failed tower(s) with all dimensions (Horizontal and vertical dimensions including the base width of tower)					
37.	Tower Weight	16.72 MT				
38.	Tower spotting data					
39.	Tower Schedule for the failed section	Tower No	Type of Tower	Span Length	Angle of Deviation	Cum. Length (M)
						From Kishenpur
		237	SB+0		07°50'00"LT	82712
				250		
		238	SC+9		19°58'00"RT	82962
				612		
		239	SD+6		53°00'00"RT	83574
40.	Sag tension calculation considered for the design of towers					
41.	Design Document of Failed Tower					
42.	Any other relevant information:					

4. 765 kV S/C Lucknow - Bareilly

Sl. No.	Details	Remarks
1.	Name of Transmission line with voltage level	765 kV S/C Lucknow - Bareilly
2.	Date and time of occurrence/discovery of failure	03-09-2025, 06:54 Hrs
3.	Length of line (km)	251.473km
4.	Type of configuration [(S/C, D/C, M/C, S/C strung on D/C towers, narrow base etc.)]	S/C Horizontal Configuration
5.	Number of Towers and Type of Towers failed [Suspension/ tension/dead end/special tower /river crossing tower/ Power line crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	01 No. "A+3" Type Suspension Tower 01 No "D+3" Type Tension
6.	Tower location No. with reference to nearest substation (indicate Name)	Location no.-566, 565 near Bareli Substation
7.	Name and size of conductor	ACSR Bersimis & Dia- 35.05mm
8.	No. of sub-conductors per bundle and bundle spacing	04 sub-conductors per bundle, bundle spacing: 457 mm.
9.	Number and size of Ground wire/OPGW (if provided)	01 EW (7/3.66) & 01 OPGW
10.	Type of insulators in use (Porcelain / Glass / Polymer)	566 – Glass 565- CLR Polymer
11.	Configuration of insulators (I / V / Y / tension)	566 - "DI" Type both Side, Middle "V" Type. 565 – Quad Tension
12.	No. of insulators per string and No. of strings per phase	02/String, 02string/Phase
13.	Year of construction / commissioning	April 2014
14.	Executing Agency	M/s EMC Limited
15.	Weather condition on the date of failure	Heavy Rain & Flash Flood
16.	Terrain Category	Plain
17.	Reliability Level	2
18.	Wind Zone (1/2/3/4/5/6) and velocity of wind: Zone	IV- 47 m/sec
19.	Details of earthing of tower	Pipe type

	(pipe type/ Counter poise):	
20.	Line designed as per IS:802 (1977/1995/2015 any other code	IS:802 (1995
21.	The agency who designed the line	POWERGRID
22.	Any Special consideration in design	
23.	Details of last maintenance activity along with date	02.09.2025
24.	Power flow in the line prior to failure	517MW
25.	Any missing member found before / after failure of towers	No
26.	Condition of foundation after failure	Presently Submerged in flood. Condition to be checked later on.
27.	Brief Description of failure [Along with photographs (if available), other related information like tower schedule, newspaper clipping for cyclone / windstorm etc.]	Due to release of DAM water from NanakSagar DAM, it caused Flash Flood in Dehva River. Photographs attached.
28.	Probable cause of failure	Flash Flood
29.	Details of previous failure of the line / tower	NIL
30.	Whether line will be restored on ERS or Spare tower will be used	ERS
31.	Likely date of restoration	20.09.2025 (Time to time water is released from DAM)
32.	Present Status	Mobilization for restoration work
33.	Details of any Tests carried out after failure (attach test reports)	Samples of Tower material shall be collected and sent to NABL certified lab for testing
34.	Wind speed data of date & time of failure from nearby authorized observatory	NA
35.	Location of failed tower	
	a. Location Coordinates b. Nearest Airport c. District and State	a. 28.2778, 79.7378 – Loc 566 b. 28.2767, 79.7417 – Loc 565 c. Bareilly d. Bareilly & U. P
36.	Single line diagram/clearance diagram of failed tower(s) with all dimensions (horizontal & vertical dimensions including base width of tower)	Attached
37.	Tower weight	Approx. 17.634 MT (A+3)

		Apprx. 29.8 MT (D+3)
38.	Tower spotting data	
39.	Tower schedule of affected section	Attached
40.	Sag tension calculation considered for design of tower	T = 9.7t. Sg = 14.80Mtr.
41.	Design document of failed towers	As per IS 802-1995
42.	Any other relevant information	-

2. GETCO

The following Transmission Lines Towers of GETCO had failed during January, 2025 to June, 2025

Sl. No.	Name of the Transmission Line	Name of Utility	Date of Failure	Year of Commissioning	Wind Zone	No. of Towers Failed			Conductor
						Suspension	Tension	Total	
5	220 kV Shivilakha - PS2 Line / 220kV Shivilakha - Sankhari Line	GETCO	08.09.2025	2012	-	1	0	1	ACSR Zebra

DETAILS IN RESPECT OF EACH TRANSMISSION LINE

5. 220 kV Shivlakha - PS2 Line / 220kV Shivlakha - Sankhari Line

Sl. No.	Details	Remarks
1.	Name of Transmission line with voltage level:	220 kV Shivlakha - PS2 Line / 220kV Shivlakha - Sankhari Line
2.	Date and time of occurrence/discovery of failure:	<u>08.09.2025/16:48</u>
3.	Length of line (km):	220kV Shivlakha - PS2 Line 211.3 KM / 220kV Shivlakha - Sankhari Line 61.257 KM
4.	Type of configuration: [(S/C, D/C, M/C, S/C strung on D/C towers, narrow base etc.)]	D/C
5.	Number of Towers and Type of Towers failed: [Suspension/ tension/dead end/special tower /river crossing tower/ Power line crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	Tower Loc no: 220kV Shivlakha - PS2 Line 211.3 KM / 220kV Shivlakha - Sankhari Line common tower for both line Location as (60/563) Type of tower: Suspension, DA+0
6.	Tower location No. with reference to nearest substation(indicate Name):	220KV Shivlakha SS loc no 60
7.	Name and size of conductor:	Zebra (7 Strands of steel 3.18MM and 54 Strands of Alu. 3.18MM)
8.	No. of sub-conductors per bundle and bundle spacing:	NA
9.	Number and size of Ground wire/OPGW (if provided):	OPGW 48 Fibre
10.	Type of insulators in use(Porcelain / Glass / Polymer):	Silicon Rubber Insulator
11.	Configuration of insulators (I / V / Y / tension):	I
12.	No. of insulators per string and No. of strings per phase:	Single insulator per phase, Single string per phase.
13.	Year of construction / commissioning:	30.03.2004
14.	Executing Agency:	M/s Jyoti structure Pvt Ltd.
15.	Weather condition on the date of failure:	Due to Mewasa - Gagodar Dam Broken caused by heavy rainfall
16.	Terrain Category:	Tower designed as per IS:802, 1977, wind pressure on conductor/EW 45 kg/sq. mtr.
17.	Reliability Level:	
18.	Wind Zone (1/2/3/4/5/6) and velocity of wind:	
19.	Details of earthing of tower (pipe type/ Counter poise):	PIPE Type
20.	Line designed as per IS:802 (1977/1995/2015 any other code):	Tower designed as per IS:802 (1977), wind pressure-Medium
21.	The agency who designed the line:	Tower designed by M/s HT Power Structure Pvt. Ltd. , Gandhinagar (Kalptaru)
22.	Any Special consideration in design:	No
23.	Details of last maintenance activity along with date:	Line Ground Patrolling carried out from loc. 145 to 199 dated 04.07.2025 Line Ground Patrolling work Carried Out from loc. 337 to 374 dated 23.07.2025 Line Ground Patrolling 1 to 210 dated 03.06.2025

		Line petrolling carried out from location 108 to 145 dated 29.01.2025
24.	Power flow in the line prior to failure:	220kV Shivilakha-sankhari= 52.35 MW & 220kV Shivilakha-PS2 Line = 27 MW
25.	Any missing member found before / after failure of towers:	No
26.	Condition of foundation after failure:	Good , also Stub Stregnthing work Carried out Year - 2024
27.	Brief Description of failure: [Along with photographs (if available), other related information like tower schedule, newspaper clipping for cyclone / wind storm etc.]	Due to Mewsa - Gagodar Dam broken on dated 08.09.2025, in front upper level Landslide so All Water flow divert in Tower side so Tower was collapsed and line tripped, after patrolling it was found that tower no. 563(sankhari line) collapsed.
28.	Probable cause of failure:	Due to Mewasa - Gagodar Dam Broken caused by heavy rainfall
29.	Details of previous failure of the line / tower :	Nil
30.	Whether line will be restored on ERS or Spare tower will be used:	New tower erection done by M/S Bhumi construction
31.	Likely date of restoration:	Line Charged on dtd. 20.09.2025
32.	Present Status:	New tower erection done by M/S Bhumi construction & Line Charged on dtd. 20.09.2025
33.	Details of any Tests carried out after failure(attach test reports):	Not carried out.
34.	Wind speed data of date & time of failure from nearby authorized observatory:	6km/h on 08.09.2025 at 16.48
35.	Location of failed tower a. Location Coordinates: b. Nearest Airport: c. District and State:	A) Village - Gagodar, B) 23.404036°/ 70.766015° Ta.- Rapar, dist - Kachch state - Gujarat C) Bhuj Airport.
36.	Single line diagram/clearance diagram of failed tower(s) with all dimensions (horizontal & vertical dimensions including base width of tower)	Single line daigram & network is Attached herewith
37.	Tower weight:	3.5 MT Approx
38.	Tower spotting data:	Attached herewith
39.	Tower schedule of affected section:	Attached herewith
40.	Sag tension calculation considered for design of tower:	For ASCR zebra conductor,32degree full wind,3950kg 0 degree 2/3 full wind ,4360kg
41.	Design document of failed towers:	Attached herewith
42.	Any other relevant information:	No

3. Adani Energy Solutions Limited

The following Transmission Line Towers of T had failed during January 2025 to June, 2025

Sl. No.	Name of the Transmission Line	Name of Utility	Date of Failure	Year of Commissioning	Wind Zone	No. of Towers Failed			Conductor
						Suspension	Tension	Total	
6	400 kV Solapur-Kolhapur (CKT-2) & 400KV Solapur-Alkud (CKT-1) Transmission Line	Adani	25.09.2025	2014	2	5	0	5	ACSR Moose

6. 400 kV SOLAPUR-KOLHAPUR (CKT-2), 400 kV SOLAPUR-ALKUD LINES (CKT-1)

Sl. No.	Details	Remarks
1.	Name of Transmission line with voltage level:	400 kV SOLAPUR-KOLHAPUR (CKT-2), 400 kV SOLAPUR-ALKUD LINES (CKT-1)
2.	Date and time of occurrence/discovery of failure:	Tower No. 65 & 66 on 25.09.2025; Tower No. 67, 68 & 69 on 26.09.2025. Failure discovered same day
3.	Length of line (km):	220 km
4.	Type of configuration: [(S/C, D/C, M/C, S/C strung on D/C towers, narrow base etc.)]	Double Circuit Normal Configuration
5.	Number of Towers and Type of Towers failed: [Suspension/ tension/dead end/special tower /river crossing tower/ Power line crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	03 Towers Fully Collapsed (66,67,68); 02 Towers Partially Damaged
6.	Tower location No. with reference to nearest substation(indicate Name):	Tower No. 65–69; Approx. 24 km from Solapur
7.	Name and size of conductor:	ACSR Moose Twin Conductor, 31.77 mm Overall diameter
8.	No. of sub-conductors per bundle and bundle spacing:	2 sub conductor/phase (Twin Bundle), 450 ± 5 mm
9.	Number and size of Ground wire/OPGW (if provided):	1 no. 7/3.66 G.S Earthwire; 1 no. 24-Fiber OPGW
10.	Type of insulators in use(Porcelain / Glass / Polymer):	120kN Suspension SRI Insulator
11.	Configuration of insulators (I / V / Y / tension):	Single I-Type Configuration (Suspension)
12.	No. of insulators per string and No. of strings per phase:	01 per string; 01 per phase
13.	Year of construction / commissioning:	01.07.2012
14.	Executing Agency:	Jyoti Structure Limited (M/s JSL)
15.	Weather condition on the date of failure:	Heavy rainfall, flood, overflow of Seena River
16.	Terrain Category:	Category-2 (Plain)
17.	Reliability Level:	Reliability Level - 2
18.	Wind Zone (1/2/3/4/5/6) and velocity of wind:	Wind Zone-2, Basic wind speed – 39 m/s
19.	Details of earthing of tower (pipe type/ Counter poise):	Pipe Type Earthing
20.	Line designed as per IS:802 (1977/1995/2015 any other code):	IS 802:1995
21.	The agency who designed the line:	Jyoti Structure Limited (M/s JSL)
22.	Any Special consideration in design:	No
23.	Details of last maintenance activity along with date:	22.09.2025
24.	Power flow in the line prior to failure:	Ckt-1: 350 MW; Ckt-2: 650 MW
25.	Any missing member found before / after failure of towers:	No
26.	Condition of foundation after failure:	Area submerged under floodwater; assessment pending
27.	Brief Description of failure: [Along with photographs (if available), other related information like tower schedule, newspaper clipping for cyclone / wind storm etc.]	Likely due to severe soil erosion and flooding near Seena river

28.	Probable cause of failure:	Severe soil erosion and loss of foundation stability
29.	Details of previous failure of the line / tower :	No previous failures since commissioning
30.	Whether line will be restored on ERS or Spare tower will be used:	ERS feasibility after water recedes; Spare tower for permanent restoration
31.	Likely date of restoration:	15.10.2025
32.	Present Status:	Restoration work is in progress
33.	Details of any Tests carried out after failure(attach test reports):	Sample collection in progress; NABL lab testing
34.	Wind speed data of date & time of failure from nearby authorized observatory:	Requested from IMD
35.	Location of failed tower a. Location Coordinates: b. Nearest Airport: c. District and State:	17°27'55.89"N, 75°54'53.26"E; Village Sanjwad, Solapur, Maharashtra
36.	Single line diagram/clearance diagram of failed tower(s) with all dimensions (horizontal & vertical dimensions including base width of tower)	Enclosed
37.	Tower weight:	Tower 66: 9.05 MT; Tower 67: 8.58 MT; Tower 68: 8.58 MT
38.	Tower spotting data:	Enclosed
39.	Tower schedule of affected section:	Enclosed
40.	Sag tension calculation considered for design of tower:	Enclosed
41.	Design document of failed towers:	Available in PDF Format
42.	Any other relevant information:	

4. IndiGrid

The following Transmission Lines Towers of IndiGrid had failed during January 2025 to June 2025.

Sl. No.	Name of the Transmission Line	Name of Utility	Date of Failure	Year of Commissioning	Wind Zone	No. of Towers Failed			Conductor
						Suspension	Tension	Total	
7	400 kV D/C JALANDHAR(PG)- SAMBA(PG) (NRSS XXIX) Line	IndiGrid	26.08.2025	2004	4	3	2	5	ACSR Moose

7. 400kV D/C JALANDHAR(PG)- SAMBA(PG) Transmission Line

Sl. No.	Details	Remarks					
1.	Name of Transmission line with voltage level:	400kV D/C JALANDHAR(PG)-SAMBA(PG) Transmission Line					
2.	Date and time of occurrence/discovery of failure:	26th August 2025					
3.	Length of line (km):	134.80 KM					
4.	Type of configuration: [(S/C, D/C, M/C, S/C strung on D/C towers, narrow base etc.)]	D/C strung on D/C Tower					
5.	Number of Towers and Type of Towers failed: [Suspension/ tension/dead end/special tower /river crossing tower/ Power line crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	Tower No	Tower Type	Backward Span	Angle of Deviation	Extent of Damage	
		234	DA+0	376	0°	Peak Damaged	
		235	DB+6 (3M RC)	410	0°	Peak & Top cross arm damaged	
		236	DD+3 (4.5M RC)	471	35° 12' 0" RT	Tower Collapsed	
		237	DA+0	400	0°	Tower damaged above belt section	
238	DA+3	422	0°	Peak & Top cross arm damaged			
6.	Tower location No. with reference to nearest substation(indicate Name):	16/4, 16/6, 16/7, 16/8, 16/9, 16/10 and 17/0					
7.	Name and size of conductor:	Twin ACSR Moose					
8.	No. of sub-conductors per bundle and bundle spacing:	Twin Bundle					
9.	Number and size of Ground wire/OPGW (if provided):	Earthwire & 1 OPGW (24 Fiber)					
10.	Type of insulators in use(Porcelain / Glass / Polymer):	Polymer					
11.	Configuration of insulators (I / V / Y / tension):	“I” & Tension					
12.	No. of insulators per string and No. of strings per phase:	2 (Two)					
13.	Year of construction / commissioning:						
14.	Executing Agency:	KEC International					
15.	Weather condition on the date of failure:	Heavy Rains occurred in the region					
16.	Terrain Category:	Plain					
17.	Reliability Level:	1					
18.	Wind Zone (1/2/3/4/5/6) and velocity of wind:	WZ-4 velocity 47m/sec					
19.	Details of earthing of tower (pipe type/ Counter poise):	Pipe Type Earthing					
20.	Line designed as per IS:802 (1977/1995/2015 any other code):	IS 802 (Part 1 / Sec 1) : 2015/TS					
21.	The agency who designed the line:	KEC International					
22.	Any Special consideration in design:	Drag Coefficient as per IS 802 (1995) & WZ as per National Building Code					
23.	Details of last maintenance activity along with date:	09.08 2025					
24.	Power flow in the line prior to failure:	154 MW in 400 kV Line -01 & 154 MW in 400 kV Line -02. Total 308 MW					

25.	Any missing member found before / after failure of towers:	No																								
26.	Condition of foundation after failure:	Foundation of tower no 236 is completely damaged due to erosion of soil																								
27.	Brief Description of failure: [Along with photographs (if available), other related information like tower schedule, newspaper clipping for cyclone / wind storm etc.]	Erosion of soil due to heavy flooding occurred due to widening of the river.																								
28.	Probable cause of failure:	Heavy flooding which led to widening of the river leading of erosion of soil of tower foundation.																								
29.	Details of previous failure of the line / tower :	Nil																								
30.	Whether line will be restored on ERS or Spare tower will be used:	Already restored on ERS and restoration on original coordinates is in progress.																								
31.	Likely date of restoration:	Ckt-1 and Ckt-2 were restored on ERS on 30.09.2025 and 16.10.2025 respectively. Line will be restored on towers in May 2026																								
32.	Present Status:	Line had already been restored on ERS. To revive the line on original coordinates, pile foundation is being done																								
33.	Details of any Tests carried out after failure(attach test reports):	Enclosed material test report of failed tower materials																								
34.	Wind speed data of date & time of failure from nearby authorized observatory:	Data not available with IMD.																								
35.	Location of failed tower a. Location Coordinates: b. Nearest Airport: c. District and State:	<table><tr><th>Tower No</th><th>Tower Type</th><th>Easting</th><th>Northing</th></tr><tr><td>234</td><td>DA+0</td><td>376</td><td>0°</td></tr><tr><td>235</td><td>DB+6 (3M RC)</td><td>410</td><td>0°</td></tr><tr><td>236</td><td>DD+3 (4.5M RC)</td><td>471</td><td>35° 12" 0' RT</td></tr><tr><td>237</td><td>DA+0</td><td>400</td><td>0°</td></tr><tr><td>238</td><td>DA+3</td><td>422</td><td>0°</td></tr></table>	Tower No	Tower Type	Easting	Northing	234	DA+0	376	0°	235	DB+6 (3M RC)	410	0°	236	DD+3 (4.5M RC)	471	35° 12" 0' RT	237	DA+0	400	0°	238	DA+3	422	0°
Tower No	Tower Type	Easting	Northing																							
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235	DB+6 (3M RC)	410	0°																							
236	DD+3 (4.5M RC)	471	35° 12" 0' RT																							
237	DA+0	400	0°																							
238	DA+3	422	0°																							
36.	Single line diagram/clearance diagram of failed tower(s) with all dimensions (horizontal & vertical dimensions including base width of tower)																									

37.	Tower weight:	S.No.	Item	in Kg
		1	Stub-DD	838.555
		2	Stub N&B	9.540
		3	DD Tower	24,864.868
		4	DD Tower-N&B	835.776
		5	DD Tower-Packwasher	36.088
		6	DD Tower-Accessories	18.280
		7	+3m	4,396.250
		8	+3m -N&B	153.352
		9	+3m -Pack washer	16.874
			Total (in kg)	31,169.583
			Total (in MT)	31.170
38.	Tower spotting data:			
39.	Tower schedule of affected section:			
40.	Sag tension calculation considered for design of tower:			
41.	Design document of failed towers:			
42.	Any other relevant information:			

Annexure-III: Proforma for reporting of failure of EHV Transmission Line Towers

Sl. No.	Details	Remarks
1.	Name of Transmission line with voltage level:	
2.	Date and time of occurrence/discovery of failure:	
3.	Length of line (km):	
4.	Type of configuration: [(S/C, D/C, M/C, S/C strung on D/C towers, narrow base etc.)]	
5.	Number of Towers and Type of Towers failed: [Suspension/ tension/dead end/special tower /river crossing tower/ Power line crossing/Railway Crossing etc., with / without extension (indicate the type & length of extension)]	
6.	Tower location No. with reference to nearest substation (indicate Name):	
7.	Name and size of conductor:	
8.	No. of sub-conductors per bundle and bundle spacing:	
9.	Number and size of Ground wire/OPGW (if provided):	
10.	Type of insulators in use(Porcelain / Glass / Polymer):	
11.	Configuration of insulators (I / V / Y / tension):	
12.	No. of insulators per string and No. of strings per phase:	
13.	Year of construction / commissioning:	
14.	Executing Agency:	
15.	Weather condition on the date of failure:	
16.	Terrain Category:	
17.	Reliability Level:	
18.	Wind Zone (1/2/3/4/5/6) and velocity of wind:	
19.	Details of earthing of tower (pipe type/ Counter poise):	

20.	Line designed as per IS:802 (1977/1995/2015 any other code):	
21.	The agency who designed the line:	
22.	Any Special consideration in design:	
23.	Details of last maintenance activity along with date:	
24.	Power flow in the line prior to failure:	
25.	Any missing member found before / after failure of towers:	
26.	Condition of foundation after failure:	
27.	Brief Description of failure: [Along with photographs (if available), other related information like tower schedule, newspaper clipping for cyclone / wind storm etc.]	
28.	Probable cause of failure:	
29.	Details of previous failure of the line / tower :	
30.	Whether line will be restored on ERS or Spare tower will be used:	
31.	Likely date of restoration:	
32.	Present Status:	
33.	Details of any Tests carried out after failure (attach test reports):	
34.	Wind speed data of date & time of failure from nearby authorized observatory:	
35.	Location of failed tower a. Location Coordinates: b. Nearest Airport: c. District and State:	
36.	Single line diagram/clearance diagram of failed tower(s) with all dimensions (horizontal & vertical dimensions)	

	including base width of tower)	
37.	Tower weight:	
38.	Tower spotting data:	
39.	Tower schedule of affected section:	
40.	Sag tension calculation considered for design of tower:	
41.	Design document of failed towers:	
42.	Any other relevant information:	

Annexure-IV: Composition of Standing Committee of Experts

Central Electricity Authority
Office of the Secretary

Date 24/9/99

No.5-41/98/Secy/CEA / 809

(Technical Committee No. 16)

Office Memorandum

Subject: Constitution of Standing Committee of Experts to investigate the Failure of Towers.

Because of transmission line tower failures taking place in the country, resulting in disruption of power on large scale for long periods, it has been decided as per chapter-II, para 3 (viii) of the Electricity (Supply) Act, No 54 of 1948 to constitute a Standing Committee, consisting of experts in the field of EHV Transmission lines from CEA, Power Grid, CPRI, IIT Delhi, & SEB (of the State, where tower failure has taken place). In the event of any failure of towers for transmission lines of 220kV and higher voltages of power utilities, members of the committee should immediately visit the site to have first hand information and ascertain the causes of failure and give recommendations to prevent such recurrences in future.

2. The scope and terms of reference of the committee shall be as follows:

(i) To investigate the causes of failure of towers.

(ii) Recommendations to avert recurrences, of such failures in future.

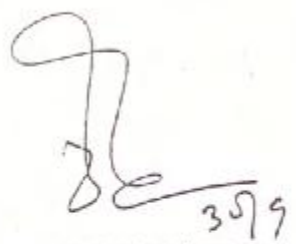
3. Committee will submit its report within three months, from the date of failure.

4. Concerned power utility will provide all assistance, required by the committee in carrying out the meetings, make arrangements for immediate site visit after failure of towers by providing transport and travel facilities and preparation of the report.

5. All the Organisations/Power Utilities are requested to nominate their officers/alternate as their representative, and intimate to Chief Engineer STC, C

Every incident of Tower failure must be immediately reported to Chairman, CEA and Members of the Standing Committee.

8. This issues with the approval of Chairman, CEA.


(VIJOY KUMAR)
Secretary (CEA)

✓ CMD Power Grid, New Delhi.

✓ DG CPRI, Bangalore.

✓ Head of Civil Engg. Deptt., IIT Delhi

Chairman of SEBs/Transmission Corporation/Grid Companies

PS to Chairman, CEA

PS to Member (PS), CEA

As per list
Enclosed.

✓ Copy to: Chief Engineer (GM), CEA

PS to Secy CEA

ssm
11/10/99

केविप्रा
CEA

भारत सरकार
केन्द्रीय विद्युत प्राधिकरण
सचिव का कार्यालय
सेवा भवन, आरओ केओ पुरम्,
नई दिल्ली - 110 066



(अ.प्र.सं. 3001/2004)

o.CEA/5-41(18)/Secy-2012 / 166

Dated: 06.08.2012

OFFICE ORDER

Subject: Re-composition of the Standing Committee of Experts to investigate failure of towers-Amendment - Reg.

Standing Committee of Experts was constituted vide this Office Memorandum Technical Committee No. 16) of even no. dated 30.09.1999 to investigate the causes of failure of towers. After the enactment of Electricity Act, 2003, it is felt necessary to re-compose the above said Committee. The revised Composition of the Standing Committee of Experts to investigate failure of towers is given below:

- | | | |
|---|---|------------------|
| 1. Chief Engineer, SETD, CEA | - | Chairperson |
| 2. Additional Director, (CPRI) | - | Member |
| 3. Head, Deptt. of Civil Engg, Delhi Technological University- | - | Member |
| 4. Representative from Power Utility
where Power failure occurred | - | Member |
| 5. Member Secretary, Regional Power Committee
where Power failure occurred | - | Member |
| 6. Director (Transmission), SETD, CEA | - | Member Secretary |

The other terms of reference shall remain the same as indicated in the above referred Office Memorandum.

(M.S. Puri)

Secretary, CEA

Tel. No.26108476

To:

- ✓ 1. Chief Engineer, SETD, CEA
2. Director (Transmission), SETD, CEA
3. Additional Director, Mechanical Engineering Division, Central Power Research Institute (CPRI), C.V. Raman Road, Bangalore
4. Head, Deptt. of Civil Engineering, Delhi Technological University, Shahbad Daulatpur, Bawana Road, Delhi

Sh. Salvoor

21/8/12

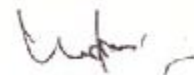
5. Representative from Power Utility (as per list enclosed)
6. Member Secretary, Regional Power Committee
(NRPC, WRPC, SRPC, ERPC & NERPC)

Copy for information to:

1. SA to Chairperson, CEA
2. SA to Member (PS), CEA

Copy for kind information to:

1. Secretary, Ministry of Power, Sharam Shakti Bhawan, Rafi Marg, New Delhi
2. Chairman and Managing Director, Powergrid Corporation of India Ltd., Saudamini, Plot No.2, Sector-29, Gurgaon



(M.S. Puri)
Secretary, CEA
Tel. No.26108476

