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CESC's Perspective on Best O&M Practices for Distribution Transformers and its adoption in Kota and Bharatpur

7th September, 2017

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DTRs in CESC Network

Current Population: 8273 Nos. (2857 MVA)

Demand served by the DTRs: 1700 MVA

315 KVA DTR: 4634 Nos. (56%), - '03

400 KVA DTR: 3201 Nos. (39%), '03 - '14

500 KVA DTR: 63 Nos. (0.75%), since '2014

Dry Type DTR: 1854 Nos. (22%)

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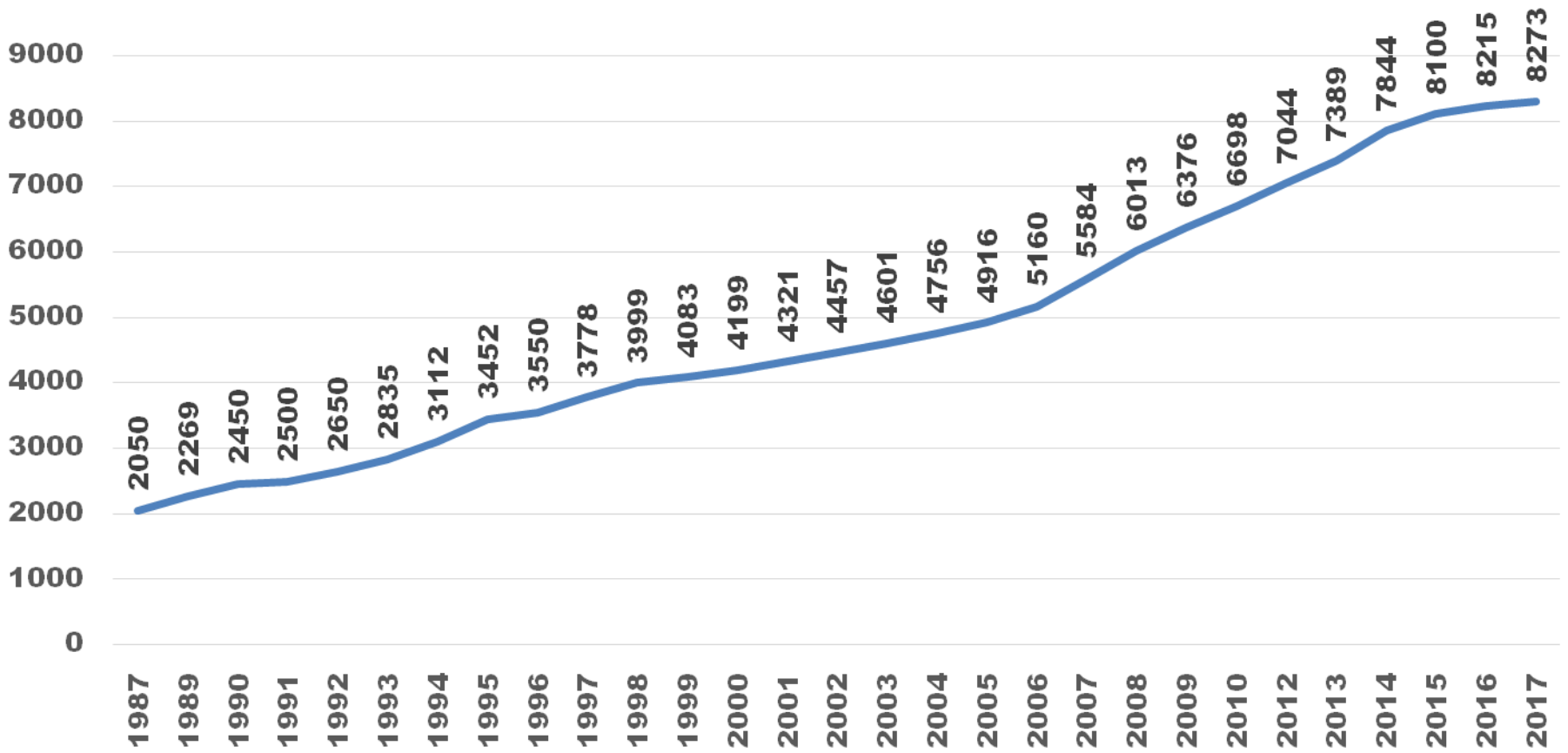
Growth of Population



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Failure of DTR in last 3 FYs

DTR Failed in '16-17: 34 Nos. (0.41%)

DTR Failed in '15-16: 44 Nos. (0.54%)

DTR Failed in '14-15: 40 Nos. (0.49%)

Over a population base of 8000+

Definition of failure: DTR with fault in winding and needs winding replacement.

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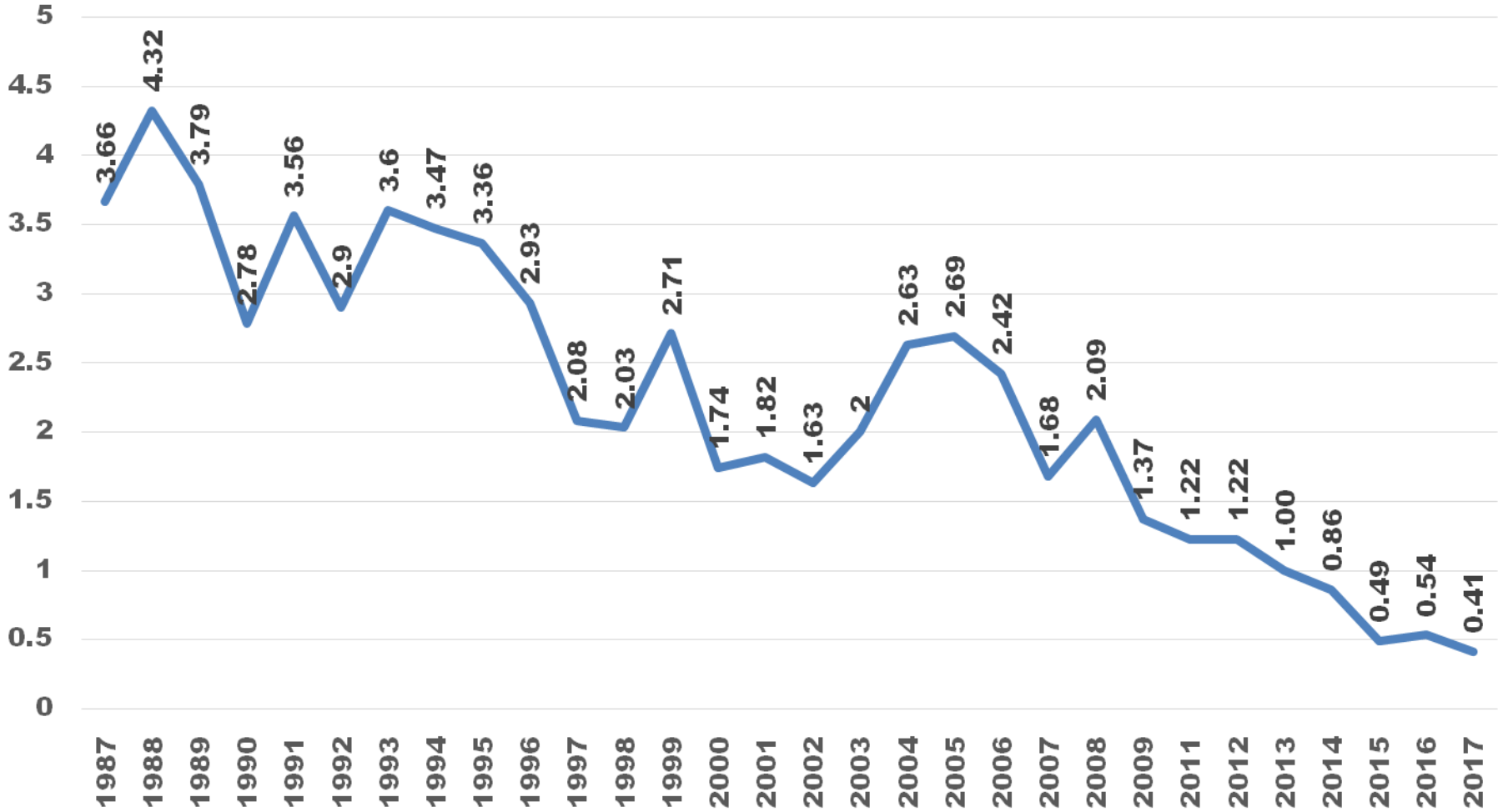
Failure of DTR Over Years



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Practices Followed

Procuring DTR only from the Suppliers of proven quality and under 5-Yrs warranty.

Standardised and Functional Requirement based Specification. Drawings are provided to the OEMs; instead of taking the same from them for approval.

Procuring/Installation of only Cu-wound DTR.

All DTRs are protected through HRC fuse on both LT and HT side.

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Practices Followed (Contd.)

DTRs with cable box termination are only used in all outdoor installation; thus avoiding possibility of external short circuit.

Procuring only Dry type DTR; thus no failure due to oil pilferage. Oil type DTRs, in network, are provided with welded m.s. guard over their drain valves.

Inspection and Testing of all new DTR through an exhaustive checklist.

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Practices Followed (Contd.)

Each new DTR is tested by calibrated equipment of our own, on reaching the same at stock points.

DTR of each batch of supply is subjected to Loss Measurement and tested for Temperature Rise Test.

DTRs, on random selection, are tested for S.C. Test at CPRI/ERDA on regular basis.

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Practices Followed (Contd.)

DTR repairing process in CESC is also quality-centric – no partial winding repair, critically reviewed scope of repair-work, similar stringent acceptance criteria as that of new DTR and 3-years warranty period.

Each failed DTR is brought back to our workshop for thorough investigation/assessing probable cause of failure (RCA) – has strengthened FRS

Each DTR is now fitted with a small metering kiosk and metered - facilitating load monitoring and control.

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Practices Followed (Contd.)

Visual inspection and on-line monitoring of each DTR is carried out as per set regime. Thermo-graphic scanning and PD monitoring is done during on-line monitoring.

Corrective maintenance work (CBM) is done based on the outcome.

In-house developed MIS, named DTLMS to archiving and operate all stages of Life Cycle of DTR starting from Procurement to Disposal.

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Conclusion

So ……..

We need to take multifarious measures, for enhancing operational reliability and service life of the DTR, starting from continual change in specification and product improvisation, procurement / repair from the proven vendors, rigorous acceptance test and condition-based maintenance and all through a strong database management system.

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Thank You