

**DETERMINATION OF CAPITALIZATION VALUES  
FOR NO LOAD LOSSES AND LOAD LOSSES OF  
DISTRIBUTION TRANSFORMERS**

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Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree  
Master of Science

Department of Electrical Engineering

University of Moratuwa  
Sri Lanka

April 2015

## **DECLARATION**

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## ABSTRACT

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Transformers are one of the better efficient components in the electricity distribution network. Basically substation transformers and distribution transformers are currently used in the electricity distribution network in Sri Lanka. Evaluation on the purchasing price of the transformer is not enough during the purchasing process. There are losses due to no load losses and load losses in the transformer during life which is about 30-35 years. Therefore, transformer purchaser must be look at total life time cost of the transformer during the purchasing process. Traditionally, this evaluation is done based on Total Owning Cost (TOC). Currently in Sri Lanka, CEB does not use competitive bidding process in purchasing of distribution transformers. And also, CEB has not defined capitalization values for distribution transformers to evaluate them based on TOC.

Main objective of this research is to set up a methodology to calculate capitalization values for distribution transforms in Sri Lanka using IEEE loss evaluation guide. Capitalization values for distribution transformers depend on capacity cost and energy cost, economic considerations and load profile of distribution transformers. In this research, capitalization values are calculated for three different load profiles, i.e. rural, semi urban and urban. A computer based methodology was developed to calculate capitalization values as an outcome of this research. In future, CEB can purchase distribution transformers by using these capitalization values for different applications, i.e. rural electrification, loss reduction in urban cities, augmentation of distribution transformers, etc. And also, any other utility can use computer based model to calculate capitalization values for distribution transformers at any given time corresponding to a set of economic and other parameters.



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Key words

Total Owning Cost

Ceylon Electricity Board

Institute of Electrical and Electronic Engineers

## **ACKNOWLEDGEMENT**

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First and foremost, I would like to express my sincere gratitude to my supervisors Eng. W.D.A.S. Wijayapala and Eng. S.R.K. Gamage, for their continuous guidance, constructive feedback and support extended throughout this research. Despite their busy schedule, they always remained accessible and their guidance and advice, expertise and insight were by all means truly invaluable.

I would also like to thank all the panel members from the academic staff of Electrical Engineering Department of University of Moratuwa their valuable feedback during the progress reviews.

Thankfulness is extended to my friends in the Ceylon Electricity Board especially to Eng. G. Kishorkumar, Eng. H.D.S. Pathirana, Eng. I.D.J.U. Hemachandra, Eng. (MS) U.S. Gunathunga and Eng. P.M. Piyasena for the encouragement and support given to me for bringing this task to a success.



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Finally, I am grateful to my mother, Udari and other family members for all the sacrifices they made along the way and for all the support given to me during various endeavors in my life.

H.M.S.L.G. Bandara

April 2015

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## LIST OF ABBREVIATIONS

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Abbreviation	Description
CEB	Ceylon Electricity Board
EC	Energy Cost
ET	Efficiency of Transmission
FC	Fixed Charge Rate
IEEE	Institute of Electrical and Electronic Engineers
IF	Increasing Factor
LF	Load Factor
lf	Loss Factor
LRMC	Long Run Marginal Cost
LTL	Lanka Transformer Limited
PL	Uniform Annual Peak Load
RF	Peak Responsible Factor
SC	System Capacity Cost
TOC	Total Owning Cost



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