

REACTIVE POWER MANAGEMENT AND OPTIMIZATION OF TRANSMISSION LOSSES FOR TRANSMISSION NETWORK



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02-244181-008**

**A thesis submitted in fulfillment of the
requirement for the award of the degree of
Master of Science (Electrical Engineering)**

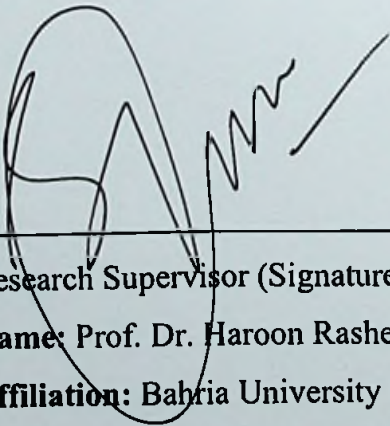
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May 2021

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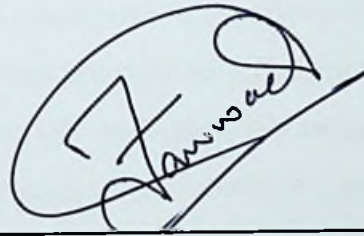
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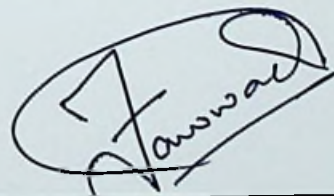
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Acknowledgment

First and foremost praise and thanks to ALLAH the most beneficent and merciful, for his showers of blessings throughout my research work to complete it successfully.

I would like to declare my special thanks of gratitude to my research supervisor, Honorable Prof. Dr. Haroon Rasheed, Department of Electrical Engineering, Faculty of Electrical Engineering, Bahria University, Karachi whose valuable guidance, dedication, dynamism, vision, sincerity, and motivation enables me to complete my research work. His door always remains open for me whenever I needed or stuck into trouble.

I would like to thank Dr. Najam Muhammad Amin, Head of the Department, and all faculty members of the Department of Electrical Engineering, Bahria University, and Karachi.

I would like to especially thank Dr. Mohsin Aman (External Examiner) from NED University of Engineering & Technology & Dr. Anzar Alam (Internal Examiner) from Bahria University for their invaluable suggestions and support to complete this thesis.

I acknowledge Prof. Dr. Muhammad Hameed Ur Rehman (Father), Dean Faculty of Humanities and Social Sciences, Metropolitan University, Karachi, and Dr. Qudsia Begum (Sister), Department of Biochemistry, University of Karachi, for providing their assistance and support towards my research.

Finally, I am highly thankful to all those peoples who offered their help directly or indirectly throughout this work.

Abstract

Reactive power (RP) plays a substantial role in transmission network efficiency. Though, the management of reactive power is extremely challenging for utility companies with diverging loads and deviating seasonal conditions. To cope with the reactive power flow of the transmission network, that is a dense network of lines (transmission) deals with different voltage levels, substations or grid stations and, different types of transformers. . In this research, the Transmission network of a utility company (radial system) selected to analyze the reactive power management (RPM) and optimizing their transmission losses for this Transmission losses were simply calculated by using the load flow method of a power system, while technical losses were calculated by suitable load-flow studies simulated under the Power System Simulator for Engineering (PSS/E) Software. The model presented in this study was simple, work on different phases, and easily applicable to a large transmission network comprising several buses. After the simulation studies, it was observed that the control and management of reactive power by adding the different sizes of capacitors locate on different buses at the transmission network of a utility company is adequate to improve the voltage profile in the selected case study. It not only improves the transformer's loading but also provides system stability to the case study along with the reduction of stress levels on the entire network of a utility company.

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