ACTIVE AND REACTIVE REGULATION OF A V2G INTEGRATED DISTRIBUTION SYSTEM IN 24 HOUR HORIZON

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DEDICATION

I, dedicate this thesis to my beloved parents, professor and friends who support, motivate and encouraged me throughout the thesis. The most influenced person through this duration is my father. He dreamt and encouraged me to do. Without his dedication and interest, it was not possible. I also dedicate my work to those with whom my educational concerns were not attached. But they have contributed a lot to boost my skills, filled my life with love and able me to complete this task.

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And lastly would like to say thanks to Almighty God, thank you for strength, guidance, protection and skills and for giving us a healthy life.

DECLARATION OF AUTHORSHIP

I **UMER AZHAR Reg.# 01-244162-021** hereby declare that content of my research work is my own work and that it is the result of work done during the period of enrolment. To the best of my knowledge, it doesn't have any material published previously or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text.

Date: _____ _____

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ABSTRACT

This study presents approach to reduce the line and transformer overloading using plugin electric vehicles (PEVs) connected to microgrid assisted charging station (CS) via vehicle-to-grid (V2G) control strategy. Microgrid have multiple DG's wind power, solar power, Diesel Generator that connected to conventional Power Grid. Intermittent nature of renewable energy set challenge to integrate with main grid. There are many challenges some are harmonic, frequency and voltage fluctuation that compromise the quality of grid. And some other problems are like conventional transmission lines cannot accommodate the renewables. Power couldn't be kept same under these different sources that interrupt the power supply operation to load. Due to these various causes distribution system is often overloaded and doesn't meet the demand. Therefore, for smooth operation or reduce the line and transformer overloading this technique is introduced. Here this research shows the power from vehicles is regulated towards grid in unbalanced scenario. This research ensures the smooth operation in 24-hour horizon and performing active and reactive power regulation. The power regulation study, using V2G techniques, that will be covered in this research and results obtain from MATLAB simulation on 14 busbar system of IEEE will be discussed.

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