DEPARTMENT OF ELECTRICAL ENGINEERING

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CERTIFICATE

I, **VIJAY PRIYADARSHI**, Roll No. 2K12/PSY/23 student of M. Tech. (POWER SYSTEM), hereby declare that the dissertation/project titled "**DYNAMIC STABILITY ENHANCEMENT OF POWER SYSTEM USING FUZZY LOGIC BASED POWER SYSTEM STABILIZER**" under the supervision of J.N.RAI. of Electrical Engineering Department   Delhi Technological University in partial fulfillment of the requirement for the award of the degree of Master of Technology has not been submitted elsewhere for the award of any Degree.

Place: Delhi   **(VIJAY PRIYADARSHI)**

Date: 24.07.2014

(J. N. RAI)

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Vijay Priyadarshi
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DECLARATION

I, VIJAY PRIYADARSHI hereby declare that the work, which is being presented in the project report entitled, "**DYNAMIC STABILITY ENHANCEMENT OF POWER SYSTEM USING FUZZY LOGIC BASED POWER SYSTEM STABILIZER**" submitted for partial fulfilment of the requirements of the award of the degree of Master of Technology (POWER SYSTEM) is an authentic record of my own work carried out under the able guidance of J. N. RAI, Assoc. Professor, EED, DTU. The matter embodied in the report has not been submitted for the award of my other degree or diploma.

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ABSTRACT

Synchronisation loss and frequent breakdowns of power systems with subject to low frequency oscillations are a major threat to power system. Oscillations of 0.2 to 3.0 Hz, are caused due to system disturbances which in some cases may increase also. The reduction of power transmission capability and loss of synchronism and even breakdown of whole power system are the result of these oscillations.

The conventional methods to improve power system stability are usually sluggish in nature. Design of quicker and reliable control techniques have always been a tedious task for a power engineer. Newer techniques like Fuzzy, Neural network, genetic algorithm and hybrid of these namely Neuro-Fuzzy, etc. are promising future solutions which is seen in the literature.

Fuzzy systems eliminate the mathematical blocks and thus reduce the system complexity by reducing the time for control. Using Fuzzy Logic causes the implementation easier and increases the computational capability. A single machine connected to an infinite bus is used here and fuzzy logic controller is used to control the response, finally the results are computed and compared with the conventional solution techniques to prove the advantage of the Fuzzy logic.

CONTENTS

LIST OF ABBREVIATIONS

AVR   Automatic Voltage Regulator

AEA   Adaptive Evolutionary Algorithm

ANFIS   Adaptive Neuro-Fuzzy Inference System

CPSS   Conventional Power System Stabilizer

COS   Centre of Sum

FLPSS   Fuzzy Logic Power System Stabilizer

FL   Fuzzy Logic

FRMG   Fuzzy Reference Model Generator

GN   Generalized Neuron

GA   Genetic Algorithm

LFO   Low Frequency Oscillation

MF   Membership Function

MOM   Mean of Maxima

MISO   Multi Input Single Output

MRAC   Model Reference Adaptive Controller

NN   Neural Network

PSS   Power System Stabilizer

PI   Proportional Integral

PID   Proportional Integral Derivative

RFLPSS   Robust Fuzzy Logic Power System Stabilizer

RNNC   Recurrent Neural Network Controller

SMIB   Single Machine Infinite Bus

STR   Self-Tuning Regulator

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