OPTIMIZED AUTOMATIC GENRATION CONTROL OF A HYDROTHERMAL POWER SYSTEM WITH CAPACITIVE ENERGY STORAGE

A project report submitted in partial fulfillment of the requirements
For the award of the degree of

BACHELOR OF TECHNOLOGY
IN
ELECTRICAL & ELECTRONICS ENGINEERING

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CERTIFICATE

This is certify that the project report entitled **"OPTIMIZED AUTOMATIC GENRATION CONTROL OF A HYDROTHERMAL POWER SYSTEM WITH CAPACITIVE ENERGY STORAGE"** is a bonafide work submitted by **A PRADEEP KUMAR, D THARAKA NAGA SAI KUMAR, K CHANDRA MOULI, P RAJA SEKHAR** and **N NAGA SRINIVASA REDDY** in partial fulfillment of the requirements for the award of degree of

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ABSTRACT

Changes in the power system load affects mainly the system frequency, while the reactive power is less sensitive to changes in frequency and is mainly dependent on fluctuations of voltage magnitude. So the control of the real and reactive power in the power system is dealt separately. The load frequency control mainly deals with the control of the system frequency and real power whereas the automatic Voltage regulator loop regulates the changes in the reactive power and voltage magnitude. Load frequency control is the basis of many advanced concepts of the large scale control of the power system.

In this work, Automatic Generation Control (AGC) of an interconnected power system with a Capacitive Energy Storage unit (CES) is studied. The system transfer function model comprises hydro and thermal power generations with governor models and system load for studying the dynamic response for small load perturbations. Integral controllers have been considered in both the areas whose optimal values are obtained by minimising the Integral Squared Error (ISE) technique. The dynamic responses without and with CES unit are compared. Simulation studies reveal that with the application of the CES unit, there is an improvement in AGC in terms of peak amplitudes and deviations in frequencies of both the areas.