

## MITIGATION OF TORSIONAL OSCILLATIONS IN TURBINE GENERATOR SET USING GATE CONTROLLED SERIES CAPACITOR

ANKAMMA RAO J<sup>1</sup>, SRINIVAS S. T. P<sup>2</sup> & B. VENKATA PRASANTH<sup>3</sup>

<sup>1</sup>Assistant Professor, Samara University, Samara, Afar Region, Ethiopia

<sup>2</sup>Assistant Professor, QIS College of Engineering and Technology, Ongole, Andhra Pradesh, India

<sup>3</sup>Professor & Head, Department of Electrical & Electronics Engineering, QIS College of Engineering and Technology,  
Ongole, Andhra Pradesh, India

### ABSTRACT

The sub synchronous resonance (SSR) phenomenon may occur when a steam turbine-generator is connected to a long transmission line with series compensation. The main purpose of this work is to verify the capability of the gate-controlled series capacitor (GCSC) to mitigate SSR. For this study the GCSC was tested in conjunction with the IEEE First Benchmark Model. The actual possibility of controlling SSR was verified by digital simulation using the Alternative Transients Program/Electromagnetic Transients Program. As a result it was shown that GCSC can damp SSR even without a specific control. It was also shown that, using a simple controller, SSR as well as electromechanical oscillation can be damped.

**KEYWORDS:** Capacitor Compensated Transmission Lines, Power Generation, Mechanical Factors, Power System Dynamic Stability, Power System Modeling, Sub Synchronous Resonance, Thyristor Applications, Turbo-Generators