

## LOCATION OF SERIES FACTS DEVICE USING GENETIC ALGORITHM AND ENHANCEMENT OF STABILITY USING SELF-TUNING THYRISTOR CONTROLLED SERIES COMPENSATOR

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### ABSTRACT

In recent years, continuous and reliable electric energy supply is the objective of any power system operation. Over last decade FACTS devices have become popular and are very effective solution for many power system transmission problems. FACTS controllers can be used for steady state voltage regulation and control, steady state control of power flow on a transmission line, transient stability enhancement. Along with this, it also reduces the problem of sub synchronous resonance. In this regard, Flexible Alternative Current Transmission Systems (FACTS) devices play a key role in enhancing controllability and increasing power transfer capability of the network. Thyristor Controlled Series Compensator (TCSC) is an emerging FACTS device designated to achieve this objective. The location of FACTS device plays a very important role. In this paper, Genetic algorithm is used in finding optimal location of TCSC. The TCSC consists of two SCR's connected back to back which needs to be tuned properly at instants of faults or changes in load condition. Inorder to enhance stability the TCSC should be tuned properly. A self-tuning TCSC control scheme is proposed in this paper. An IEEE 5 bus system is considered to test credibility of the proposed method and the results thus obtained are subjected to analysis to determine the optimal location and also enhancement of stability.

**KEYWORDS:** Flexible Alternative Current Transmission Systems, (FACTS), Genetic Algorithm (GA), Thyristor Controlled Series Compensator (TCSC), Self Tuning Thyristor Controlled Series Compensator