

ABSTRACT

The Thyristor Controlled Series Capacitor (TCSC) is one of the most effective Flexible AC Transmission System (FACTS) devices. It offers smooth and flexible control of the line impedance with much faster response compared to the traditional control devices.

While numerous studies concerning the utilization of these devices, have been carried out so far, most of the research has focused on issues such as transient stability improvement, sub-synchronous resonance (SSR) mitigation, damping of power swings, voltage collapse, etc. In this project, the modeling of TCSC for power flow studies has been discussed and presented in detail.

In this model the state variable is the TCSC's firing angle, which is combined with the nodal voltage magnitudes and angles of the entire network in a single frame-of-reference for a unified iterative solution through a Newton-Raphson power flow method.