

ABSTRACT

Thyristor Controlled Series Capacitors (TCSCs) are FACTS devices which incorporate power-electronic-based and other static controllers to enhance controllability and increase power transfer capability. This research investigated the possibility of applying TCSCs on the South African transmission network, in particular application on long transmission lines connecting bulk thermal generators in the northern part of South Africa to load centres located hundreds of kilometres elsewhere in the country. The investigation, conducted using PSS/E (a power system analysis software) demonstrated that application of TCSCs on this part of South African transmission network results in improved transient stability margins. The resulting improvement in transient stability is comparable to other transient stability enhancement options like addition of transmission lines, thus the use of TCSCs can be considered as an alternative. Further studies would be vital to understand the interaction between Power System Stabilizers (PSSs) and TCSCs in order to ensure proper tuning and interaction amongst the devices.

Key Words – Thyristor Controlled Series Capacitors (TCSCs), Critical Fault Clearing Time (CFCT)