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¹Boussadia Fethi & Belkhiat Saad

Electrical Engineering Department, Ferhat Abbas Setif 1 University

Corresponding author e-mail: fboussadia@univ-setif.dz

Abstract

This paper presents a new method to prevent Cascaded tripping of power lines due to mal-operation of distance relays during major power system disturbances by using Thyristor-controlled series capacitor (TCSC) controllers. These controllers are able to change the network parameters in a fast and effective way in order to limit the consequences and prevent development of disturbances. The behavior and the performance of distance relays with and without TCSC controllers during the March 31, 2015 blackout in Turkey are analysed. The simulation results using URPC software clearly indicate that the use of TCSC controllers could improve reliability of relay operation, enhance the stable operation of power system and prevent future mal-operation involving distance relays in Turkish power system.

Keywords: *Distance Relay Protection, Thyristor-Controlled Series Capacitor, Blackout, Overload Conditions*