

A Fast Protection Scheme for TCSC Compensated Transmission Line Using Wavelet-Alienation-Neural Technique

Bhuvnesh Rathore¹, Amit Gangwar², Om Prakash Mahela³, baseem khan⁴, and Sanjeevikumar *Padmanaban⁵

¹JIET

²Government Engineering College Jhalawar

³Indian Inst Technol

⁴Hawassa University

⁵Aarhus Universitet Science and Technology

May 11, 2021

Abstract

This paper proposes a security algorithm based on the wavelet-alienation-neural technique for detecting, classifying, and locating faults on Thyristor-Controlled Series compensator (TCSC) compensated lines. A fault index has been calculated using wavelet transform and alienation coefficients with post-fault current signals measured/ sampled for quarter cycle time at both near and far end buses for fault detection and classification. The location of the fault is predicted using an Artificial Neural Network (ANN) after the fault has been diagnosed. Approximate coefficients (quarter cycle time) of both voltage and current signals, from both buses, were provided as input to ANN. Various case studies, such as variations in TCSC position, fault location, sampling frequency, power flow path, incipient angle of fault, TCSC control strategy, fault resistance, and load switching conditions, have verified the robustness of the proposed safety system.

Hosted file

A_demonstration_of_the_LaTeX_class_file_for_Wiley_NJD_Journals.pdf available at <https://authorea.com/users/413124/articles/521562-a-fast-protection-scheme-for-tcsc-compensated-transmission-line-using-wavelet-alienation-neural-technique>