Transmission Line Faults Analysis Using S-transform and ANN

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Abstract*: The S-Transform (ST) and ANN-based fault detection & fault classification approach for overhead transmission lines are presented in this research. The PSCAD environment is used to simulate the test system. The current signals must be extracted at the network's transmitting end in order to use the suggested technique. ST processes the current signals to create intricate S-matrices. S-matrix algorithms that require only basic calculations and little computational time are used to calculate the Stockwell Fault Index (SFI). The energy of each phase is a different property that is estimated from the S-matrix. The back propagation neural network classifies the type of fault by feeding it the energy content of each phase as determined by S-matrices of various fault states. On the basis of 65 fault condition simulations, a detection and classification system based on these parameters has been created. By altering the fault inception angle (FIA), numerous fault situations have been obtained. The suggested system was written in MATLAB, and quick and precise results were produced. Future ST implementations are planned to be computationally quick.*

Keywords: Stockwell transform, Stockwell fault index, S-matrix, Transmission line faults, ANN

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