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Thesis Title : Distance Relay for Parallel Transmission Lines
Base on Transputer System By Fourier Transform
12 Samples per Cycle.

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Abstract

Distance relay is a device used for the purpose of protecting high voltage transmission line by measuring the impedance of transmission line, and then the measured value will be compared with the one under the normal condition. If the former one is lower than the latter, it is understood that the fault occurs in the line.

If, in the case of parallel transmission line, both circuits are well transposed, mutual coupling positive sequence impedance is lower. In contrast, mutual coupling zero sequence impedance remains high and this may result in the errors of the impedance measuring as well as fault locator although the fault does not occur in the zone of protection.

The thesis studies the impedance characteristics of parallel transmission line during the faults at any position. Also, the said impedance characteristics are considered as area tripping of the distance relay. This project consists of hardwares and softwares of transputer which are capable of operating with IBM PC microcomputer. The relay constructed is a digital relay designed with 12 samples each of current and voltage per cycle and impedance calculation by means of

Fourier transformation. Then, the operation of relay is tested at the duplicate transmission line by simulating fault at and out of zone of protection. The results are that the distance relay can detect fault theoretically and its operating time is 1078 ms.

The virtue of this project is to develop other types of relays without any modification to hardwares. However, impedance characteristics of parallel transmission line shall be considered in order that the distance relay is able to operate correctly for the protection of the parallel transmission line.