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Protection of the transmission line with the algorithm of the differential equation

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Abstract

This thesis is the simulation of short circuit of a power system modeling software AtpDraw then performed a numerical analysis software in Matlab, whereas in a transmission line when a fault occurs and if one considers that occurs a given distance, it is possible to express the equation of the transmission line in differential form.

The algorithm based on the differential equation determines the location of a fault using the values of resistance and reactance of the transmission line that exists at the time of its occurrence. The resistance and reactance values are proportional to line lengths therefore R and L are dependent on the line, it is possible to estimate the distance to the failure to solve a differential equation in Matlab.

In this project for the development of the algorithm is considering the use of digital filters in order to improve accuracy and performance limits to a single phase fault, with a Butterworth filter failure is analyzed, with and without load, also discusses the fails to change in impedance fault, and different times crossing the magnitude of voltage. It verifies the accuracy of the estimate failed to point showing the location and the area in which the failure occurred.