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Development of digital simulator to evaluate protective relay in traction power supply system

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Traction power supply system (TPSS) includes various equipments for feeding electric power to drive train. One of the equipments is protective relay which is most important for providing safe railway service. Especially, distance relay has been used in railways for the main protection of TPSS and over current relay is charge of its back-up in railways unlike general power system. Over and under voltage components are surely included in this relay. So, it is necessary to evaluate environmental and functional requirements. Authors have to evaluate the performance of the developed protective relay; digital simulator for railway protective relay system is developed to evaluate the developed protective relay included above relay components and fault locator by authors. This paper presents the developed digital simulator for testing of protective relay system for railway. The software for simulator has the function of converting, generating sequence waveform form simulated data by PSCAD/EMTD, communicating with relay and analysis on output data from relay. This simulator was able to evaluate several functions for each protection element such as over-current relay, impedance relay and distance relay and so on. Hardware equipment is able to generate waveforms such as signals of voltage transformer and current transformer in field substation. The simulator hardware is composed to USB analogue output board, signal isolator, control computer and signal terminal block. The USB analogue board is selected with 16 bit resolution, four channels, isolation between channels, range with -10~10 V and 100 kS/s.

Biography

Dong-Uk Jang has received his BS degree and MS degree in Electrical Engineering from Chungbuk National University. His research interests include power supply systems, high voltage engineering and insulation diagnosis for railway systems.

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