

# E7

## **Title of Abstract:**

Understanding Transmission System Ground Fault Protection

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## **Abstract (not to exceed 300 words)**

The most probable line-to-ground faults in a transmission system are possibly the least understood. The parameters of ground fault currents are influenced by various factors including system grounding, transformer winding type, fault arc resistance, transmission line ground wires, source parameters, tower footing resistance, mutual coupling, soil resistance etc.. The issues get compounded when a double phase to ground occur, not to mention about three phase faults with different fault resistances in each phase. The protection engineer has to have a clear insight into the system and its influence on the ground fault current before deciding on the protection scheme with performance parameters to meet the overall system clearance requirements. This paper lists and explains in a simple manner the most important factors that influence the ground fault currents, the understanding of which are essential for protection engineers while deciding, testing and applying the type of ground fault protection in a complex transmission or sub-transmission line system. Selling Points: 1. Explains how to look for issues in a system that influence ground faults in a transmission system and suggest appropriate protection measures to detect and clear the faults 2. Highlights some of the latest developments in modern relays that can be used to detect and clear ground faults in a reliable manner 3. Would be a good reference paper for engineers practicing transmission system protection.

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