

## Modeling of Power Network by ATP-Draw for Lightning Stroke Studies

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**Abstract :** Protection relay algorithms play a crucial role in Electric Power System stability, where, it is clear that lightning strokes produce the mayor percentage of faults and outages of Transmission Lines (TLs) and Distribution Feeders (DFs). In this context, it is imperative to develop novel protection relay algorithms. However, in order to get this aim, Electric Power Systems (EPS) network have to be simulated as real as possible, especially the lightning phenomena, and EPS elements that affect their behavior like direct and indirect lightning, insulator string, overhead line, soil ionization and other. However, researchers have proposed new protection relay algorithms considering common faults, which are not produced by lightning strokes, omitting these imperative phenomena for the transmission line protection relays behavior. Based on the above said, this paper presents the possibilities of using the Alternative Transient Program ATP-Draw for the modeling and simulation of some models to make lightning stroke studies, especially for protection relays, which are developed through Transient Analysis of Control Systems (TACS) and MODELS language corresponding to the ATP-Draw.

**Keywords :** back-flashover, faults, flashover, lightning stroke, modeling of lightning, outages, protection relays

**Conference Title :** ICEET 2016 : International Conference on Electrical Engineering and Technology

**Conference Location :** New York, United States

**Conference Dates :** June 06-07, 2016