726 – Coordinated Electric Vehicle Charging – Performance Analysis of Developed Algorithms

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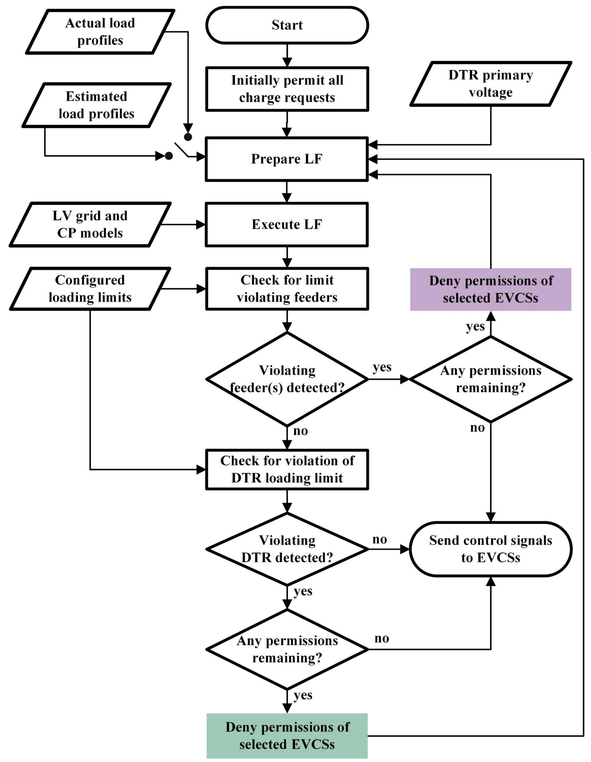
Introduction

An increasing number of residential electric vehicle (EV) charging may overload the distribution transformer (DTR) and lines at the low-voltage (LV) level in near future. Coordinated EV charging, assuming a standardized interface provided by network operators, may be used to resolve congestions.

Methodology

Coordination algorithms are tested by calculating load flows (LF) in a real LV grid. Three variants are considered:

- One control signal per LV grid
- One control signal per LV feeder
- One control signal per EV charger



Results

The coordination algorithms effectively mitigate DTR and line overloading. The more individual control signals are specified, the lower is the average charging time, and the higher are the grid utilization and energy loss.