Institute of Electrical Power Systems

Bachelor Thesis ProSafE²

DC charging stations for electric vehicles –
Periodic inspection, protective measures,
earthing and equipotential bonding, energy efficiency

In cooperation with OVE, AIT and KS Engineers

Motivation

With the ongoing market penetration of electric vehicles, the number of installed charging stations is also increasing. For fast charging of the traction battery, direct current (DC) charging stations are often used, which usually provide charging power in the range of up to several 100 kW. Compared to AC charging stations (usual charging power up to 22 kW), there are still some unanswered questions regarding protective measures, periodic inspections including the corresponding test routines, earthing and equipotential bonding, power measurement and energy efficiency.

Research Topics

- Status of national and international standards with regard to DC charging stations and technologies (OVE E 8101+AC1/EN IEC 60364 series, OVE EN IEC 61851 series, OVE EN IEC 62196 series, OVE EN 50696, OVE EN IEC 62893 series, etc.).
- Evaluation of electrical protection measures (protection against electric shock) for state-of-the-art DC charging stations
- Power resp. energy measurement for DC charging stations (DC current measurement, calibratability, etc.) in connection with billing modalities
- Description and evaluation of possible fault scenarios resp. use cases in the operation of DC charging stations
- Energy efficiency of DC charging stations in terms of rectifiers resp. converters, differences in vehicle-to-grid applications (V2G)

Procedure/Methodology/Task definition

- Detailed literature research on the corresponding research questions
- Summary of the research results and corresponding documentation
- Presentation of the results or findings in the course of the "LV Elektro-/Informationstechnisches Seminarprojekt" ("Bachelor Seminar") and documentation in the form of the Bachelor thesis.

Organisational Issues

Begin immediately

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