Institut of Electrical Power Systems

Master-Thesis

Earthing of High-Voltage Cables

Motivation

High-voltage cables are treated differently in terms of earthing. The cable shields can be earthed on one side, on both sides, with or without a surge arrester. Depending on the type of connection chosen, currents flow in the cable sheath or high voltages can occur in the sheath.

In the course of this scientific work, a position as a student project employee is planned.

The following questions are to be analysed for different application scenarios and earthing situations using simulations:

Research Questions

- How big is the influence of parallel overhead lines and other lines?
- How big is the influence of one/several return conductors depending on cross-section, distance, ...?
- Is the use of parallel return conductors necessary for current reduction in the cable shield and what is the case-dependent optimal cross-section of these return conductors?
- Questions for specific treatment
- One-sided earthing:
    - What voltages are to be expected at the open cable end?
    - When are arresters necessary for material protection (length-dependent)?
    - Are measures necessary for personal protection?
    - How great is the influence of parallel tracks and lines?
    - How much return conductor cross-section is necessary?
- Two-sided earthing:
    - How much current flows through the cable shield?
    - What sheath current densities are permissible?
    - By how much is the rated current reduced by shield currents?

Task definition

- Simulation of the different variants using the XGSLab software.

Organisational information

Start by arrangement.

Language: Optionally German or English

Supervisor

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ELEKTRISCHE ANLAGEN & NETZE TU GRAZ

In Kooperation mit:

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