DESIGN OF PARALLEL SINGLE-CORE CABLE LINES OF LOW VOLTAGE

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ABSTRACT In low-voltage power systems, when it is necessary to lead out high power, the most common method to design the electrical installation is to use multi-cable lines consisting of single-core cables in parallel connection. The primary document used by designers that regulates the issue of the cable selection in terms of long-term current-carrying capacity is the PN-IEC 60364-5-523:2001 standard. The cable layout frequently results in asymmetry of the load of particular cores. The standard neither describes this fact nor suggests any methods for the cable layouts that might minimize the effect of the interaction of the wires that leads to the uneven load of particular cables. In the extreme case, this uneven load may reach up to 100%. The article presents measurements conducted in real objects and tries to describe the considered phenomenon to model the existing network systems and to suggest a solution for designing of the parallel-cable lines.

Keywords: parallel single-core cables, current carrying capacities, proximity effects