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ANALYTICAL CALCULATION OF MAGNETIC FIELD OF THREE-PHASE CABLE LINES WITH TWO-POINT BONDED SHIELDS

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Abstract

In this paper we produce an analytical model of the magnetic field of high-voltage three-phase cable line with two-point bonded shields. It's supposed that the cable line consists of three single-core XLPE insulated cables. The produced analytical model allows to calculate the electric currents induced in shields of cables and to determine the magnetic field distribution for the arbitrary layout of cables. We receive an exact compact expression for shielding factor of the magnetic field of the trefoil cable line with two-point bonded shields. Also we receive a simplistic compact expression for shielding factor of the magnetic field of the flat cable line with two-point bonded shields. The comparison with exact analytical expression and experimental

results shows that error of simplistic expression lays within 5%. References 15, figures 7.

Key words: cable line, magnetic field, cable shield, shield grounding, shielding factor.

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