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POWER CABLE DEFECTS AND THEIR INFLUENCE ON ELECTRIC FIELD DISTRIBUTION IN POLYETHYLENE INSULATION

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Abstract

The paper studies the cable degradation mechanisms and electric field distributions in the polyethylene insulation of power cables with typical defects at macroscopic level including crack and numerous air bubbles in the insulation, protrusion of inner semiconducting layer, its air gapping with cable insulation and interruption along the cable conductor, holes in outer semiconducting layer, its delamination from copper shield as well as small air hole in the shield owing to corrosion. The three-dimensional computer modeling and analysis of electric field distributions are carried out in the chosen region of the cable containing the defects. The patterns of the distributions and local field enhancement in the vicinity of the defects are shown. The effect of defects on electric field in the polyethylene cable insulation is revealed. Reference

s 11, figures 5.

Key words: polyethylene insulation, typical power cable defects, local electric field enhancement, three-dimensional computer modeling.

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