THE BENEFITS OF TOTAL HARMONIC DISTORTION OF CURRENTS (THDi) REDUCTION IN CABLES OF LOW VOLTAGE POWER DISTRIBUTION SYSTEM

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ABSTRACT

Harmonic currents are generated by single and three-phase non-linear electronic loads. The usage of non-linear loads increasing rapidly and the quantity of these types of loads are dominant of the power system loads since its have higher efficiency and low cost. However the disadvantage of using the non-linear loads that they are producing harmonic currents that flow back in the power system and affect the power system by adding additional power loss throughout the electrical distribution system. These losses result in apparatus overheating, higher air conditioning costs, reduce the equipment life span and higher power costs. In this paper, the effect of total harmonic distortion of currents (THDi) to the cables power loss of low voltage power distribution system was examined. Hence, the benefits of reduction the THDi and the amount of power loss that could be saved also determined. A laboratory model was developed to experimentally verify the result. Good agreement was obtained between theory and laboratory experiments.