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Application of Computer Simulation for the Assessment and Optimization of Induction Electric Motors Aiming to Energy Conservation

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Abstract: - This paper shows a methodology for the assessment and optimization of induction electric motors aiming to energy conservation, through substitution of older electric motors by high-efficiency ones, including motor resizing, aided by computer simulation. This study and its application were carried out through the Electric Energy Efficiency Program promoted by the Brazilian Electric Energy Agency. The methodology adopted for the substitution of these motors included an initial study, by means of measurements of electrical parameters, through the use of a power quality analyzer. Afterwards, by using a specific simulation software, the operating conditions of the electric motor and the expected economy obtained by the use of high-efficiency motors were estimated. When necessary, the motor resizing analysis provides the best rated power for the drive. The motor substitutions carried out in this motor drives efficiency improvement program resulted in yearly savings of 3.1 GWh, equivalent to 4.52% of the previously required energy.

Key-Words: - Electric energy conservation, power quality analyzer, high-efficiency motor, motor resizing, simulation software, payback period.