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Thesis Title : An Analysis of Size and Location of Fixed Capacitor for Reduction
of Losses on 22 kV Distribution System:
Case Study of Provincial Electricity Authority of Thailand
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Abstract

The current flow in distribution system consists of real and reactive current . Them produces power losses on distribution system. Since the reactive current in distribution system not useful ,then the popular method for reduction of losses on distribution system is to reduce reactive current by installation of capacitors in the distribution system because this method is convenient and low cost , however, for maximum saving we have to search for optimum size and location of capacitors.

This research applied dynamic programming theory and load flow analysis for sizing and location of fixed capacitor on the 22 kV distribution system for maximum saving with interest rate , cost of capacitors and voltage variable taken into consideration.

After installation of 600 kVAR capacitor on feeder no.8 in 10 feeders of Chokchai substation at a distance of 66.4 km. from substation . The average value of real power increase 3.8 % and reactive power decrease 25.5 %. The two-way analysis of variance at significant level 0.05 , installation of capacitor will effect both real power and reactive power changes . The result of software analysis by optimum location of 9 sets of capacitor installed at the following distances 22,31.1,42.9,46.1,54,66,66.6,72.1 and 76.6 km. With the following sizes 300,600,300,300,300, 300 , 300 , 600 and 300 kVAR , respectively,can reduce power loss by 29.44 % and a saving of 1,050,000 baht per year .

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Committee Chairperson