

A HEURISTIC COMPUTATIONAL APPROACH TO SOLVE 28-NODE AND 72-NODE RADIAL DISTRIBUTION SYSTEM TO CALCULATE ENERGY LOSS USING MATLAB SOFTWARE

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Abstract

The demand of electrical energy in India is rapidly increasing due to industrial and population growth outstripping the available generation. This has resulted in continued shortage of power in different parts of the country, forcing impositions of restrictions and regulatory measures in the continuous use of electricity. In this paper an effort is being taken to calculate the energy loss taking place in the existing radial distribution system so that preventive measures can be taken to minimize this energy loss so that available energy can be utilized to full extent. The mathematical model of radial distribution system is first developed and then to solve this radial distribution system a new algorithm is developed in this paper which is solved using MATLAB software for calculating the energy loss of radial distribution system. This algorithm is based on simple circuit theory and can be easily understood. In this algorithm algebraic equations are solved recursively to obtain voltage at each node in the system and hence corresponding energy loss in each branch can be found. Also the branch in which the maximum energy loss is obtained is also found. To study the effectiveness of the above mentioned algorithm two examples i.e. 28-node and 72-node radial distribution system are considered. The voltage profile of both this system is plotted using the MATLAB software so that the node at which minimum voltage is obtained can be found out and the energy loss taking place in each branch is found so that effective measures can be taken to improve this voltage and minimize this energy loss.

keyword : Radial distribution system, node voltage, real power loss, reactive power loss, and energy loss.