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“A REVIEW ON POWER FLOW ANALYSIS OF THREE PHASE RADIAL POWER DISTRIBUTION SYSTEM ”

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ABSTRACT

This paper based on review of load flow analysis of radial distribution system. The problem of reactive power imbalance can be divided into single-phase and three-phase. Therefore, energy efficiency testing is another solution to optimize and improve electricity distribution and the safety of existing electrical systems. Different power measurement methods in three-phase radial distribution systems are reviewed here to improve power stability and minimize transmission lines. Based on the analysis of different authors and the advantages and disadvantages of radial distribution systems, different methods can be determined and used for three-phase radial distribution machine. Local research is also identified as part of this review.

Key Words: Load Flow analysis, Radial distribution system, Electrical system, Three phase system.

I. INTRODUCTION

Power flow or load flow studies are performed for the determination of the steady state operating condition of a power system. This is the most frequently carried out study by power utilities and is required to be performed for power system planning, operation, optimization and control. At the design stage, load flow analysis [3, 9] is used to check whether the voltage profiles are expected to be within limits throughout the network.

The effectiveness of the backward forward sweep method in the analysis of radial distribution systems has already been proven by researchers, by comparing it to the traditional load flow methods. The forward backward sweep method [1, 3, 5] is commonly used due to its computational efficiencies and solution accuracies.

Radial distribution system [2] [3] can be modeled as a network of buses connected by distribution lines, switches & transformers. The load-flow study of radial distribution network is of prime importance for effective planning of load transfer. Local Search is a family of general-purpose techniques for search and optimization problems, which are based on several variants of the simple idea. Each Local Search technique prescribes a different strategy for dealing with the foggy situation. The application of Local Search algorithms to optimization problems dates back to early 1960s. Since that time the interest in this subject has considerably grown in the fields of Operations Research, Computer Science and Artificial Intelligence. Local Search algorithms are non-exhaustive in the sense that they do not guarantee to find a feasible (or optimal) solution, but they search non-systematically until a specific stop criterion is satisfied. Nevertheless, these techniques are very appealing because of their effectiveness and their widespread applicability. [24,26,28].

II. RADIAL DISTRIBUTION SYSTEM

According to the work plan, power transmission can be divided into:

- 1) radial distribution network
- 2) ring network system

3) Interconnection system.

Selection of Radial distribution system based on load flow study can be possible for analyzing, study and review about three phase radial distribution system.

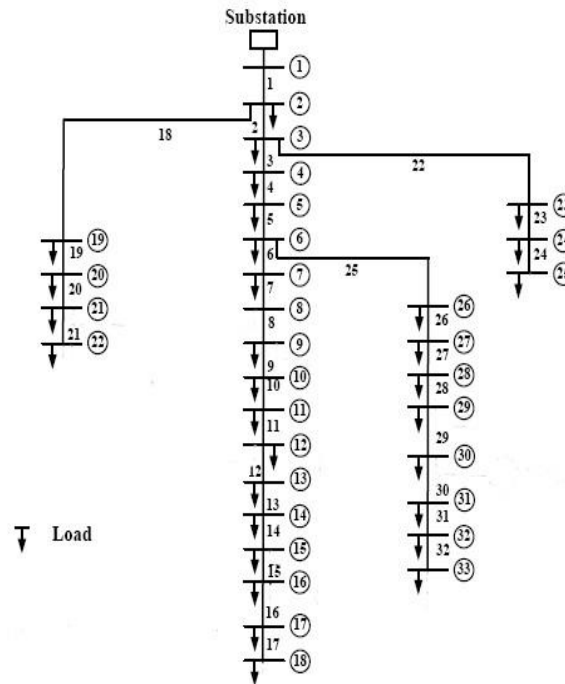
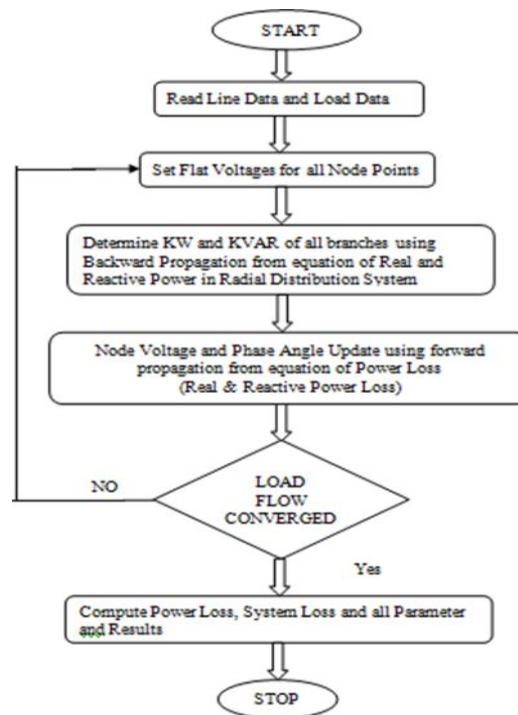


Figure:1 IEEE- 33 bus Radial Distribution System

In above figure IEEE- 33 bus system in which has distribution from bus number 18, 22 and 25. It is used to analyze for three phase RDS.

III. ALGORITHM

Load flow in three phase radial distribution can be analyzed by flow chart for determination of kW and kVAR.



IV. OPTIMIZATION TECHNIQUES

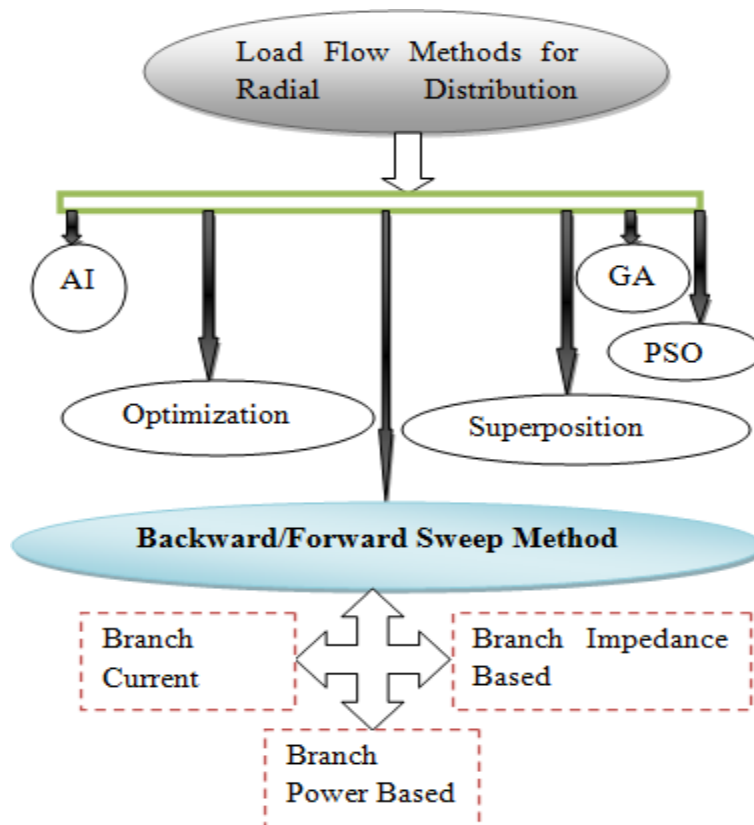
There are different optimizations techniques can be used in load flow study for three phase radial distribution system: Local search optimization: These optimization techniques are applicable for determining number of busses, nodes and any other things in radial distribution system.

- 1) Metaheuristic methods
- 2) Stochastic optimization

Table 2: Characteristics of Local Search Methods

Feature	Hill Climbing	Simulated Annealing	Tabu Search
<i>Initial Solution</i>	<i>Not Specified</i>	<i>Random</i>	<i>Not Specified</i>
<i>Select Move</i>	<i>Random</i>	<i>Random</i>	<i>Best Non Tabu</i>
<i>Acceptable Move</i>	<i>Non-Worsening</i>	<i>Always improve Worsening</i>	<i>Always</i>
<i>Stop Search</i>	<i>Idle Iterations</i>	<i>Frozen System</i>	<i>Idle Iterations</i>

As per description of another optimization techniques shown in figure there has artificial intelligence, genetic algorithm, particle swarm optimization and forward backward sweep optimization but this method is further classified on the basis of branch current based, branch power based and branch impedance based.



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