Optimal Reconfiguration and Distributed Generation placement in Baghdad Distribution Sector

Abstract - The power losses in distribution system are high, which form 70 – 80% of total transmission and distribution losses. High losses have severe impact on stability, reliability as well as economy. Therefore, minimization of these losses is very necessary. In this paper proposed various schemes to reduce the active power losses in distribution network, given as:
- Optimum reconfiguration network,
- Optimum Distributed Generation (DG) placement and
- Optimum reconfiguration with optimum (DG) placement.

Using Cymdist software to implement the optimal reconfiguration algorithm and proposed Genetic Algorithm (GA) to find the size and location, which programmed under MATLAB software package. Whereon the proposed methodology (GA) simplifies the problem by dividing it in two phases, namely Placement Planning Model (PPM) and Size Planning Model (SPM) thereby reducing the search space. It was the integration of the two methods were used after each method individually to obtain minimum real power losses with better bus voltage (better efficiency for network). To verify the proposed algorithms, IEEE 33-bus system and al – jihad neighborhood distribution system (Baghdad distribution sector) are tested. The simulation results are compared with proposed works in literature.

Keywords - Power Losses, Reconfiguration, Distributed Generation, Genetic Algorithm, Cymdist, and MATLAB.