

## **LOSS REDUCTION WITH OPTIMIZATION OF CAPACITOR PLACEMENT USING BFA ALGORITHM - CASE STUDY FOR A 20 KV NETWORK IN IRAN**

**MOEIN KHOSRAVI<sup>1</sup>, MILAD ASKARI HASHEMABADI<sup>2</sup>, VAJIHE SHARIFI DAVARANI<sup>3</sup>,  
MOHADESEH SHARIFI DAVARANI<sup>4</sup> & MAHDI MOZAFFARILEGHA<sup>5</sup>**

<sup>1</sup>Department of Electrical Engineering, Science and Research Branch, Islamic Azad University, Sirjan, Iran

<sup>2</sup>Department of Electrical Engineering, Science and Research Branch, Islamic Azad University, Kerman, Iran

<sup>3</sup>Department of Mathematics, Rafsanjan Branch, Islamic Azad University, Rafsanjan, Iran

<sup>4</sup>Department of Mathematics, Education Management, Rafsanjan, Iran

<sup>5</sup>Department of Electrical & Electronic Engineering, Payame Noor University, Kerman, Iran

### **ABSTRACT**

Increasing application of capacitor banks on distribution networks is the direct impact of development of technology and the energy disasters that the world is encountering. To obtain these goals the resources capacity and the installation place are of a crucial importance. Line loss reduction is one of the major benefits of capacitor, amongst many others, when incorporated in the power distribution system, the quantum of the line loss reduction should be exactly known to assess the effectiveness of the distributed generation. In this paper, a new method is proposed to find the optimal and simultaneous place and capacity of these resources to reduce losses, improve voltage profile too the total loss of a practical distribution system is calculated with and without capacitor placement and an index, quantifying the total line loss reduction is proposed. To demonstrate the validity of the proposed algorithm, computer simulations are carried out on actual power network of Kerman Province, Iran and the simulation results are presented and discussed.

**KEYWORDS:** Distribution Systems, Loss Reduction Index, Capacitor Placement, Bacteria Foraging Algorithm (BFA)