



University of Zabol
Graduate school
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**The Thesis Submitted for the Degree of Master of Science (M.Sc)
(In the field of Electrical Engineering)**

**Reconfiguration, capacitor switching, and determining of
renewable distributed generation power factor using
improvement multi-objective algorithm**

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Abstract

Various applications are running on distribution networks. Today, the use of renewables in these networks has also increased. These sources are connected to the main grid via an inverter and have the ability to inject reactive power into the grid by changing their power factor. This thesis deals with distribution network planning through reconfiguration, switching capacitors, and determining the optimal power factor of renewable dispersive generation sources. Here the load and power curves of the renewable resources are divided into different sections and implemented by the multi-objective genetic optimization algorithm. The objectives here are to reduce losses, improve voltage profile deviation, and reduce the energy lost from renewable sources. Due to the multiple of responses obtained from multi-objective genetic optimization algorithm, fuzzy method was used to select the appropriate solution. The proposed method is implemented on the standard IEEE 33 bus network and for various scenarios such as reconfiguration alone, switching capacitors alone, reconfiguration of the distribution network with determination of renewable sources power factor and reconfiguration of distribution network with determination of renewable sources power factor and capacitors switching are evaluated.

Key words: Reconfiguration, capacitorswitching, powerfactor, improvement, voltage profile