

# Fault location based on load flow –wave let transform in the distribution networks

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## Abstract:

One of the important aspects of distribution network is the outage management (OM). The fault location is one of the important stages in OM for reduction of interruption in the distribution network. Because of increasing the interruption cost and requirement to the suitable reliability in distribution network, determine the location of fault rapidly and is new challenge for distribution operator. This paper propose new method for the fault location. It is done based on load flow –wave let transform method. The case study illustrates the effectiveness of the presented method.

## I. INTRODUCTION

Fault location is one of the important challenges for distribution network (DN) operators. To determine location and dispatch the maintenance worker for the repairing is take long time, and then energy not supplied is increases as loss of network. However rapidly fault location can improve the indices of reliability, security and stability.

The fault location (FL) is determined precisely in the transmission network. Also they are applicable in the transmission networks. But these methods are not capability of using in DN because of the DN characteristics. Some of these reasons listed below:

1) Distribution networks are speeded in deferent areas unsymmetrical.

2) Because of variety of load in different area, there are many lateral branches unlike transmission network

3) This network converts to single phase and double phase in household consumption

4) In DN, variation of load is so much. In the other world, estimation of load is a hard work.

Respect to these reasons, FL in distribution network is harder than FL in the transmission network.

The fault location methods can be categorized in the four groups:

1) Impedance methods

2) Fault indicator

3) Heuristic method

4) Traveling wave method

A) Generally, in the impedance method the voltage and current are measured in the slack bus prior event, to calculate the fault impedance. Also, according to the line profile, the impedance of the any line point is capable to compute.

The impedance of fault location is determined by comparing the impedances. The method was very popular and a lot of research has been done on it. In rattan das method, all voltage and currents in point M are saving in the digital relay prior and during



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