**ABSTRACT**

Distributed Generation (DG) is small generation connected at distribution level. DG introduces some new challenges related to voltage quality, stability, and fault handling in the distribution networks.

Phase to phase short circuits often see on a medium voltage (MV) feeder, if it were not handle quickly, it will decreases the quality and stability of electricity.

For problem solve with a localization procedure for phase-to-phase short-circuits on a medium voltage (MV). The distance from the substation to the fault location is estimated from the fundamental frequency voltage and current measured in the substation. Loads and DG-units connected along the feeder are shown to have opposite impacts on the estimated distance. The current drawn by loads cause the estimate to become too small. DGs feed current to the fault, and cause the estimate to become too large.

Two methods to compensate for these errors are presented. In compensation method

The first, pre-fault and fault measurements from the substation are utilized for estimating the localization for phase-to-phase short-circuits.

The second, pre-fault and fault measurements from the substation and the DG-unit are utilized for estimating the localization for phase-to-phase short-circuits.

**Keywords:** Load flow, Fault localization, Medium Voltage Network, Distributed Generation, Two-phase short-circuit, Fundamental frequency components