** VAAGDEVI COLLEGE OF ENGINEERING**

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**DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING**

**ANALYSIS OF UPQC ALLOCATION ON LINE LOADING, LOSSES AND VOLTAAGE STABILITY OF RADIAL DISTRIBUTION SYSTEMS**

**ABSTRACT**

This project presents an investigative study on the analysis of unified power-quality conditioner (UPQC) allocation on radial distribution systems. A design approach for UPQC, called sag-based design for phase-angle control for UPQC (UPQC-SPAC) is proposed. The phase-angle shifting of the load voltage required to mitigate a given value of voltage sag is determined and the same is used during a healthy operating condition in order to provide the reactive power compensation of a distribution network. To study the impact of the UPQC-SPAC allocation on distribution systems, it is placed at each node, except the substation node, one at a time. The load-flow algorithm for radial distribution systemsis suitably modified to incorporate the UPQC-SPAC model. The simulation results show that a significant amount of power-loss reduction, under voltage mitigation, and the enhancement of voltage stability margin can be obtained with an appropriate placementof the UPQC-SPAC in a distribution network. The performance comparison of the UPQC-SPAC with one previously reported design approach shows that it is more efficient in under voltage mitigation. UPQC allocation should be appropriate for beneficial and more efficiency for the networks with distributed-generation units.

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