

Enhancement of voltage stability margin using facts devices for 132 kv network in Dar es salaam and coast grid zone

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The Dar es Salaam and Coast Grid Zone network of TANESCO frequently experiences voltage collapse and Grid outages, mainly, due to inability of the system to meet the demand for Reactive power. This research has described a study of FACTS devices applications, in particularly determination of adequate shunt compensators (type of FACTS devices, size, and location) in order to enhance voltage stability margin. The study is carried out for the 132 kV network in Dar es Salaam and Coast Grid Zone power system with a low load scenario. The static analysis using modal analysis approach, based on steady state voltage and transient voltage stability study are examined by using the DIgSILENT PowerFactory 14.1 software. The presented modal analysis based on steady state aspect of voltage stability shows that, both SVC and STATCOM enhance voltage stability margin and increases existing system maximum loading point to the maximum value. However, with regard to the influence on reducing overvoltage, based on current limiting functions of SVC and STATCOM, the results show that with the same reactive power rating for both the SVC and STATCOM, SVC contributes to enhancing voltage stability margin more effectively than STATCOM during overvoltage situations.