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IMPROVING VOLTAGE STABILITY BY USING *FACTS* DEVICES

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ABSTRACT

The present day power system is a large complex interconnected network that consists of thousands of buses and hundreds of generators. The network is increasing everyday with the increase in demand and to meet this, either new installation of power generating stations and transmission lines is required or the existing infrastructure operation has to be extended to limits. The laying of new lines or installation of new generating stations imposes many environmental and economical constraints. As a result the existing transmission lines are more heavily stressed than ever before and which in turn can leave power system exposed to instabilities. Voltage instability is of the phenomena which result in a major blackout. Moreover, with the fast development of restructuring, the problem of voltage instability has become a major concern in deregulated power systems. To maintain security of such systems, it is desirable to plan suitable measures to improve power system security and increase voltage stability margins. FACTS devices can regulate active and reactive power control as well as adaptive to voltage-magnitude control simultaneously because of their flexibility and fast control characteristics.

In this paper the effect of two FACTS controllers – SVC and STATCOM on voltage stability are studied. The IEEE-6bus system is simulated with continuation power flow feature of PSAT (Power system Analysis Toolkit) software. The advantage of this simulated method is to develop a simple, fast and convenient procedure which can be applied effectively to enhance the voltage stability.

KEYWORDS: Steady State Voltage Stability, SVC, STATCOM, Continuation Power Flow, Voltage Collapse, PSAT