

Enhancement of Voltage Stability by using SVC

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Abstract: *Power system stability is essential for maintaining reliable and continuous electricity supply in modern grids. Among the various solutions available, Static VAR Compensators (SVCs)—a key Flexible AC Transmission System (FACTS) device—play a pivotal role in improving stability by dynamically managing reactive power. By regulating voltage and damping oscillations, SVCs enhance grid performance and mitigate fluctuations that could lead to instability. This project investigates how SVCs contribute to power system stability through real-time reactive power control, ensuring voltages remain within safe limits while minimizing losses. Through simulation studies and case analyses, the effectiveness of SVCs is evaluated under diverse operating scenarios, demonstrating their ability to strengthen grid resilience. Additionally, PI-based control strategies are designed and implemented to optimize SVC performance, further enhancing power quality. The results underscore the importance of SVCs in modern power networks, highlighting their impact on reliability, efficiency, and overall system stability.*

Keywords: *Power system stability*

