

The paper proposes a framework for the selection of optimal configuration of line compensation devices, thyristor controlled series capacitors (TCSC) and conventional fixed series capacitors, for reducing the risk of subsynchronous resonance (SSR) in the network while maintaining required power transfer. The methodology developed in the paper is based on the robust risk evaluation of SSR that takes into consideration the severity of subsynchronous resonance and probability of its occurrence. The subsynchronous resonance risk index developed previously is used to assess the severity of subsynchronous resonance. The line outage model is employed to determine the probability of contingencies potentially leading to subsynchronous resonance. It is demonstrated that with relatively small participation of TCSC, even with the most basic control, in series compensation of lines, the risk of SSR can be successfully managed.