Improvement of Voltage Sag and Dynamic Stability For Different Load arrangements by Using Multi-Pulse STATCOM

Ali M. Yousef , Ahmed A. Hafez

Abstract:

A power system is frequently exposed to overloading. This may introduces a number of unavoidable consequences as voltage sag, voltage dip and or power instability. This article advises remedy for such problems in a power system which is loaded by heavy static and dynamic loading levels. A multi-pulse D-STATCOM is to be incorporated in the power system under concern. The STATCOM generally enjoys the merits of fast response and reduced volumetric dimension. Moreover, it was investigated for boosting power system stability under different disturbance scenarios. However, a less is reported regarding stability under heavy loading condition. This article investigates design and analysis of application of multi-pulse D-STATCOM for improving voltage sag and power system stability under different loading types/levels. A simple and robust controller is advised for fulfilling the operation requirements. PSCAD software is used as platform for investigating the dynamic behavior of the system under concern. Comprehensive analysis and results are provided to validate the applicability and functionality of the D-STATCOM. The simulation results prove the capability of the D-STATCOM in mitigating voltage sag and enhancing power system stability while improving power quality of the distribution system.

Keywords:

Voltage sag; power stability; D-STATCOM; PSCAD; Dynamic performance; Static/Dynamic Load levels.

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