

EVALUATION OF STATIC SYNCHRONOUS COMPENSATOR FOR DISTRIBUTION SYSTEMS

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Abstract

Power quality problems are an important issue on transmission and distribution systems. These problems can be solved by means of improvements such as power compensation, voltage regulation and harmonic filter. Distribution Static Compensator (D-STATCOM) which is state of art for the Flexible AC Transmission Systems (FACTS), are used for increasing power quality of transmission and distribution system, because of its several compensation capabilities such as reactive power control, voltage sag-swell control, mitigation of flicker and harmonic filtering etc. D-STATCOM is a device connected in parallel to the inverter-based network used in both distribution and transmission systems. In this study, general wavelet algorithm is written mathematically. The performance of this method has been studied and tested using PSCAD / EMTDC software.

Key words: D-STATCOM, reactive power compensation, PSCAD/EMTDC, harmonics.

1. Introduction

The rapid increase in the demand for electrical energy in the world and in our country and the changes in the load characteristics related to the electrical power systems together with the developing technology caused the power quality (PQ) in electricity to gain importance. PQ problems are defined as changes in the amplitude, frequency and waveform of the voltage or current that cause malfunction of the devices using electrical energy. The most common electrical power quality problems in electrical distribution systems are voltage pit, voltage peaks, voltage and current harmonics, low power factor, voltage and current imbalances. Effective redress of these PQ problems enables the transmission and distribution systems to be operated at lower costs and to provide the electrical energy to consumers with better quality. Since conventional compensation devices that cannot react quickly to the correction of PQ problems are insufficient, there is a need to develop power electronics-based compensation