

DIGITAL SIMULATION OF EIGHTY FOUR PULSE STATCOM FOR IMPROVEMENT OF POWER QUALITY

SNEHASISH PAL¹ AND SUVARUN DALAPATI²

¹ Asst. Professor (SR.), Department of Electrical Engineering,
JIS College of Engineering, Kalyani-741235, West Bengal, India

² Asst. General Manager (R & D), Electronic Systems Division, Stesalit Limited,
Stesalit Towers, 1st Floor, E-2/3, Block EP – GP, Salt Lake Sec-V, Kolkata- 700091. India.

Abstract

With the trend of progression of distributed generation within a bulk power system, there is a need to support busbar voltage by injecting appropriate reactive power, which can also improve the dynamic behavior of a power system. Static Synchronous Compensators(STATCOMs) is a power electronic based synchronous voltage generator(SVG) ,which provides embedded control of transmission-line voltage and power flows. The paper represents the internal structure of the eighty four pulse Statcom based on one twelve pulse converter with a Seven Level VSI for reduction in THD at the output voltage of the load in power systems. The integration of energy storage with a Statcom can extend traditional Statcom capabilities to four quadrant power flow control and transient stability improvement. The proposed model of the STATCOM is connected to a 25kv, 60 Hz system and simulation(in MATLAB) results are presented for demonstrating its steady state and dynamic performance. Fast Fourier Transform(FFT) analysis has also been carried out and the results showing the value of THD within acceptable limit and fast control of the reactive current. Thus the Statcom shows excellent transient response to step change in the reactive current reference.

Keywords: STATCOM, FFT, MATLAB, THD.