CHAPTER 1

INTRODUCTION

Power electronics has grown rapidly in recent years because of advances in power semiconductor devices, new power converter circuit topologies, the use of advanced control techniques, and improvements in packaging and manufacturing. Industrial applications, flourished, are adjustable speed drives, uninterruptible power supplies and industrial power supplies for welding, materials processing and a host of other applications. These advances in technology and design techniques provide opportunities for improveme

customers, is vulnerable to significant damage and loss. Interruptions and disturbances in supply voltage can shut down, damage, or even destroy the equipment it is attempting to run. The imbalance of supply and demand for energy in California led to rolling blackouts in 2001; facing challenges meeting energy needs with their current power supply. With the deregulation of power industry, it is expected that power electronics will be more active in energy generation and distribution as well.

Thus the market is largely driven by the need for uninterrupted, high-quality power, as companies are anxious to avoid both the inconvenience and potential financial losses caused by sudden power failures. Rising awareness about environmental concerns and unpredictability of conventional energy prices prompt the Government to emphasize the need for alternative sources of energy.

Converters are going to play increasingly important roles in the future energy intensive economy. Therefore, it is essential that we have efficient methodologies for their control, which will also help to improve their design and achieve the optimal, minimalist structures resulting in cost reduction, efficient improvement and reduction of the space they occupy. The control of these converters is a study, which involves a deep understanding of modulation schemes, and the mathematical methodologies that can be applied to determine various combinations for switching the power devices ON or OFF in order to synthesize the desired reference output. Even under fault conditions it is very valuable in designing converters with self-repair and reconfiguration capabilities.

to be used in three-phase voltage source inverter. The developed theory is validated via experimental results.

Chapter 4 discusses the m