

WAVELET-BASED NEURAL RECOGNITION SYSTEM FOR POWER QUALITY EVENTS

S. Kaewarsa, K. Attakitmongcol

*School of Electrical Engineering
Suranaree University of Technology*

111 University Avenue, Muang District, Nakhon Ratchasima, 30000, Thailand

Phone (66) 0 4273 4724-5, Fax (66) 0 4273 4723

E-mail: suriya_ka@hotmail.com

Keywords: power quality, distributed generation, wavelet transform, neural network, pattern recognition, learning vector quantization

ABSTRACT

Power quality has become an important issue in distributed generation nowadays due to the ever increasing use of power electronics and sensitive load equipment. The addition of distributed generation can have a significant effect and increases the complexity of power quality problem. Recognition of power quality problems by analyzing the voltage and current waveform disturbances is a very important task for the power system monitoring. This paper presents a new approach for the recognition of power quality disturbances using wavelet transform and neural networks. The proposed method employs the wavelet transform using multiresolution signal decomposition techniques working together with multiple neural networks using a learning vector quantization network as a powerful classifier. Various transient events are tested, such as voltage sag, swell, interruption, notching, impulsive transient, and harmonic distortion. The results show that the classifier can efficiently detect and classify different types of power quality signal.