

Title: **Analysis of personal computer ride through capability during voltage sags**

Authors: Hussain Shareef <sup>1</sup>, Azah Mohamed <sup>1</sup>, Nazri Marzuki <sup>2</sup>

<sup>1</sup> Department of Electrical, Electronic and Systems Engineering, Faculty of Engineering, Universiti Kebangsaan Malaysia, 43600 Bangi, Malaysia

<sup>2</sup> National Metrology Institute of Malaysia, Lot PT 4803 Bandar Baru Salak Tinggi, 43900 Sepang, Malaysia

Journal: Electric Power Systems Research, Volume 79, Issue 12, December 2009, Pages 1615–1624

### **Abstract**

Voltage sags have emerged as one of the most serious power quality problems, particularly for sensitive equipments such as personal computers (PCs). It is a complex electronic computing device designed to be powered by a switch mode power supply (SMPS). This paper presents an investigation of vulnerability of PCs to voltage sags and development of methods to enhance the voltage sag ride through capability of PCs. Based on recent testing standards, extensive tests were conducted for a wide range of PCs. For standard reboot/restart malfunction criterion, sag depth and duration were varied to construct individual voltage immunity curves for PCs. Based on the analysis, two methods were implemented to improve the voltage sag ride through capability of the PCs. These methods include the use of additional dc capacitors and alteration of the under voltage detection (UVD) signal in the housekeeping block of the SMPS. The experimental results on different PCs show that installation of additional capacitors can only expand PCs' immunity duration to voltage sag while shift in the UVD signal helps to enhance the tolerance level in terms of sag magnitude. Finally, the advantages and disadvantages involved in the implemented methods to enhance voltage tolerance level of PCs are highlighted.