

QUALITY AND STABILITY ASSESSMENT IN A WIND POWER SYSTEM

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Abstract

The power generation by wind is increasing day by day due to its proven technology as compared to other non-conventional sources of energy. The power quality of this generation is poor at the terminal of wind generator because of switching of power semiconductor devices. This paper deals with two important aspects of wind power system (i) Power Quality and (ii) System Stability. The quality of wind power is decided by IEEE standard Viz. IEEE Standard 519-1992 and IEEE Standard 1547 [1, 3, 6]. The experiments were carried out at the Vankusavade wind power project, Satara, (M.S.), India. The results are then verified by PSCAD/ETAP simulation software. The system is also simulated for system stability considering the various faults on the simulated model. The voltage distortion at the wind turbine generator on 415 V side is very high as compared to that of on 33 kV and 220 kV side. The distortion at 33 and 220 kV level is meeting the power quality standards.

Keywords : Voltage Sag, Harmonics, Voltage/Current Distortion Factor, Stability