

Abstract: Development of a controller based analysis of photovoltaic power generation system under variable conditions of utility

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Abstract

This paper presents development of a controller based test system as a controller for testing photovoltaic (PV) power generation system. The analysis of grid-connected PV power generation system to observe the phenomenon and confirm the stability on the PV power generation system under the variable conditions occurred in utility was performed. The utility is stable in the steady state but the utility condition can be changed by unexpected phenomenon. The effect of grid condition should be analyzed to make sure the stability of the grid-connected PV power generation system. The PV power generation system is connected to a utility grid through an inverter and several conditions of grid are modeled by using real time digital simulator (RTDS). A RTDS is employed to calculate the variable conditions of grid. The voltage source inverter is controlled by a digital signal processor connected between gigabit transceiver analogue output card and a gigabit transceiver digital input card in the RTDS interface boards. Experiment results are presented and analyzed to show the effect of a variable conditions to the PV system.