

Modeling and design of photovoltaic power plant connected to the MV side of Malaysian grid with TNB technical regulation compatibility

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Abstract

Increasing penetration of photovoltaic power plants (PVPPs) to the electrical grid leads to continuous evaluation of grid interconnection requirements. For this purpose, Malaysian grid representative from Tenaga Nasional Berhad (TNB) issued technical rules and requirements concerning the connection of photovoltaic system to low and medium voltage networks. The objective of this paper is to design a large-scale PV plant connected to the MV side of the Malaysian grid, taking the compliance of TNB technical regulations into consideration. In this study, the PV plant has been modeled using MATLAB/Simulink with nominal rated peak power of 1.5 MW. The sizing of suggested PV system is achieved in which the simulation results matched the sizing calculation results. The paper focuses on the model's ability to reflect the important requirements that a PVPP should have based on TNB rules for MV connection. The results show that the proposed PVPP is compatible with TNB requirements.

Keywords Photovoltaic power plant · PV inverter · Grid-connected PV system · Malaysian grid · Distribution generator