

GRID-CONNECTION STUDY OF THE CENTRALIZED PHOTOVOLTAIC POWER SYSTEM IN ZARZITTA

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ABSTRACT

Zarzitta is a small village situated in the north-western region of Aleppo province and is about 40km away from Aleppo, the second largest city in Syria. In 1997, the Japan International Cooperation Agency (JICA) and the Syrian Scientific Studies & Research Centre (SSRC) built a 35kW centralized photovoltaic (PV) power system for the village, within a collaborative pilot project. Recently, there has been a considerable increase in power consumption by villagers due to village expansion and the increasing amount of electricity consumed per capita. Therefore, the local authority for electricity distribution has planned to connect the village's isolated network to the public distribution grid / network. The paper mainly concentrates on the matter of the steady-state voltage rise at the village's low-voltage network, due to the interconnection of the PV power system as a distributed generator, proposes a design procedure for the extended medium-voltage / low-voltage (MV/LV) network and its connection to Zarzitta. It also describes the centralized PV power system and its operation in grid-connection mode, and overviews technical features of the public distribution network in local area around and near the village. Computational results based on the design procedure in addition to dynamic-simulation tests based on a 45kW induction machine as a dynamic-load, are presented with comments.