

## INFLUENCE OF THE POWER CONTRIBUTION OF A GRID-CONNECTED PHOTOVOLTAIC SYSTEM AND ITS OPERATIONAL PARTICULARITIES

Wilson Negrao Macedo<sup>a,1</sup>. Roberto Zilles<sup>b,\*</sup>

<sup>a</sup>*Grupo de Estudos e Desenvolvimento de Altermativas Energeticas da Universidade Federal do Pará, Belém, Brazil*

<sup>b</sup>*Instituto de Eletrotécnica e Energia, USP, Av. Prof. Luciano Gualberto, 1289, 05508-900 São Paulo, Brazil*

### Abstract:

This paper shows the relationship between the energy contribution of an 11.07 kWp grid-connected photovoltaic system and the particularities of its operation in parallel with a conventional electric distribution grid. Taking the experimental results as a starting point, it was verified that the contribution to the building's annual consumption is about 55% of the total load. The experimental results show how this kind of device influences the power quality parameters of the building: total harmonic distortion (THD), power factor (PF), and RMS voltage. The building power factor can be altered in a significant way depending on the system's production capacity and on the building load profile. Therefore, if a great number of PV systems are connected to the distribution grid, the reverse power flow coming from those systems can cause an increase in the voltage of a feeder and eventually cross the allowed upper threshold.