

Study of the Influence of Lithium Batteries on the Power Network

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Abstract— This article presents the study of connecting a lithium storage battery to the public distribution network. We are following the battery loading and unloading effects from the network and its influence on network parameters, namely: voltage, frequency, short term flicker, the total voltage harmonic distortion (THD-U). The first set of measurements lasts for 24 minutes. In the first 11 minutes the battery is scheduled to discharge 50%, the following minute discharge 100%, the next minute charge 100% and the remaining 11 minutes discharge 50%. Throughout this period the parameters of the distribution network are monitored. Other sets of measurements refer to charging/discharging the battery and reverse and monitoring the network parameters. For each set of measurements were performed as many as 5 tests, the values being approximately equal. The measurement results are compared with the limits of European standard EN 50160. Monitoring of the parameters of the distribution network was performed using analysis software imcPOLARES R1 SP1 V2.2 that allows monitoring in real time of the network parameters and enables generation of a report that compares the measured data with the limits of the international standard EN 50160. When the measurements are complete, we observe that admissible limit values were not exceeded.