Loss current model for a lead-acid battery acting as energy storage unit in a stand-alone renewable energy system

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Abstract An improved model for the loss current of a lead-acid cell under stand-alone renewable energy systems operating conditions is presented. Models from the literature are reviewed. The prediction of the proposed model is compared with experimentally data. The model is particularly well suited for applications where current rates are variable, as is the case of stand-alone photovoltaic systems. The loss current prediction is necessary for real time battery state of charge evaluation. The battery state of charge is often used as command parameter, being an important variable for system control operation. The loss current model is a component of the lead-acid battery model, which is necessary in order to estimate the performance of system operation.

Keywords: Lead-acid cell, modeling, loss current, renewable energy systems.