

Advances in PNNL's Vanadium Redox Flow Battery Stack

V. Sprenkle, E. Thomsen, W. Wang, B. Li, B. J. Koepfel,
K. P. Recknagle, X. Wei, Z. Nie, Q. Luo, D. Reed

Recent advances to PNNL's Vanadium redox flow battery stack utilizing mixed acid electrolytes will be reported. Stacks consisted of approximately 15 cells with active areas of 780 cm^2 , Figure 1. The developed stack is capable of delivering more than 2 kW in the operation range of 15~85% state of charge at 160 mA/cm^2 with an energy efficiency of 77% and energy content of 1 kWh. Operation at higher current densities and the influence on capacity fade and efficiencies will be presented. A partial transfer method and variable flow rate process has been studied to potentially alleviate capacity fade and improve system efficiencies, respectively. Additional developments aimed at decreasing stack costs, improve system efficiencies, and increase reaction kinetics at

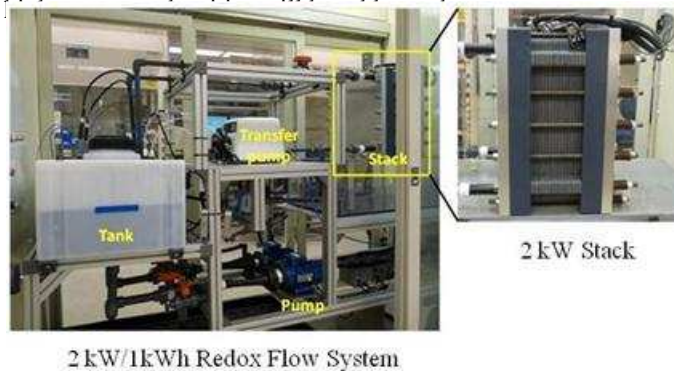


Figure 1. PNNL Redox Flow Battery System.