ABSTRAK

Penurunan kinerja baterai, *cycle life*, dan *safety* baterai disebabkan faktor kerja baterai LiFePo4 (*Lithium iron phosphate*) melebihi *temperature* operasional 40^{o}C. Permasalahan penelitian adalah distribusi panas dengan variasi sistem pendinginan dan pengaruh fluida untuk baterai LiFePo4. Tujuan penelitian adalah menganalisis persebaran panas baterai dan *temperature* baterai LiFePo4 dibawah *temperature* operasional. Metode penelitian adalah kuantitatif eksperimen, dengan dilakukan simulasi *Computational Fluid Dynamics* (CFD) untuk sistem pendingin baterai LiFePo4. Baterai LiFePo4 tanpa pelat pendingin disimulasikan untuk hasil *temperature* maksimum baterai. *Temperature* operasional baterai lebih rendah 40^{o}C dengan tambahan pelat pendingin yang dirangkai pada baterai dengan variasi fluida air dan udara yang mengalir dalam pelat pendingin. Hasil dan kesimpulan penelitian adalah data kenaikan *temperature* maksimum baterai 1,2^{o}C dan persebaran panas yang merata pada permukaan baterai dengan variasi pelat pendingin yang dialiri fluida air.

Kata Kunci : *Sistem Pendingin, Baterai Lithium Iron Phosphate, Pelat Pendingin, Fluida Air*

ABSTRACT

The decrease in battery performance, cycle life, and battery safety is caused by the work factor of LiFePo4 (Lithium iron phosphate) battery exceeds the operational temperature of 40^{o}C. The research problem is heat distribution with cooling system variation and fluid effect for LiFePo4 battery. The research objective is to analyze the heat distribution of the battery and the temperature of the LiFePo4 battery below the operational temperature. The research method is quantitative experiment, with Computational Fluid Dynamics (CFD) simulation for LiFePo4 battery cooling system. LiFePo4 battery without cooling plate was simulated for maximum battery temperature result. The operational temperature of the battery is lower by 40^{o}C with additional cooling plates assembled on the battery with variations of water and air fluids that flows in the cooling plates. The results and conclusions of the research are data on the maximum battery temperature increase of 1,2^{o}C and the distribution of heat evenly on the surface of the battery with a variation of the cooling plate flowing with water fluid.

Keywords : *Cooling System, Lithium Iron Phosphate Battery, Cooling Plate, Water Fluid*