



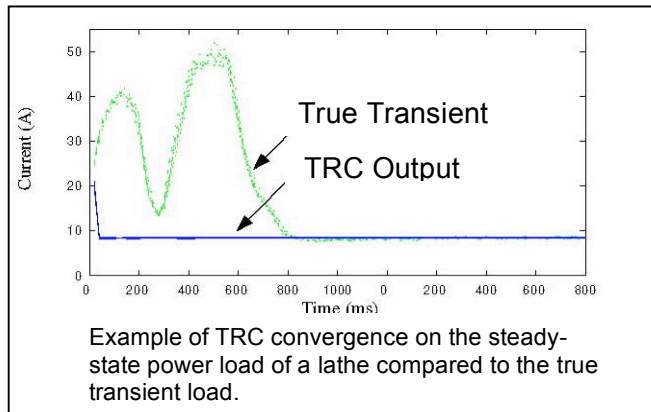
Technology Available for Licensing

Improved hybrid fuel cell performance through prediction and control of transient power loads

Technology Description

A new Transient Recognition Control (TRC) module for hybrid fuel cells uses algorithms to estimate the steady state information of load transients. The estimated load is fed to the fuel cell's current control system so that the fuel cell can rapidly ramp-up and supply appropriate steady state current load with minimal transient impulse shock. The TRC has the potential to improve the reliability, operation effectiveness, and lifetime of hybrid fuel cells and other emerging power technologies.

Load transients in many fuel cell applications involve significant peaks in power relative to the steady-state demand. The effects of load transients can be reduced by combining fuel cells with energy storage devices such as capacitors or batteries to form a hybrid system. The transient performance of a hybrid fuel cell is improved when the control system can determine the future behavior of a transient power load. Existing techniques to alert a hybrid system of startup behavior of key loads may not react quickly enough to address the time-scale of the transient or may require the arrival of a full power wave pattern.



In laboratory testing the TRC has effectively trained on power loads and empirically determined the transient pattern thus avoiding the need to have a complete pattern. The TRC can predict the complete transient pattern with as little as 10% of the transient load wave received. Such early prediction - before waiting to have the complete wave pattern - promises to save computational cost and storage space, help solve numerical problems, and improve performance of a hybrid fuel cell systems.

Benefits

- Rapid prediction of transient loads in hybrid fuel cell and other emerging power systems.
- Requires only a short sample of the transient power wave to predict the complete wave pattern.
- Saves computational cost and improves real time performance of a hybrid fuel cell system.

Technology Transfer and Development Status

Patents are pending and research papers are available.

Contact for licensing or further details

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