

## **(24) Motor Control and Power Conversion Technologies Using FLEXMOD**

The key objective of this 18-month program is to develop a flexible, universal, modular inverter platform that can be applied to a range of electric motors from fractional horsepower to 100 horsepower or more.

Total project cost: \$486,484

Funding request: \$389,184

Project Lead: Advanced Energy

Project Participants: Raser Technologies, Inc., Washington State University Energy Program

Start Date: March 28, 2005

End Date: September 28, 2006

### Presentations/Publications

None.

### Patents

None.

### Progress in Past Quarter and Current Status

For the third quarter of 2006, we completed performance verification testing in early June as described in the previous progress report. All efforts since then have focused on developing the final report. The report is still in draft but the approved abstract is below:

There is a market need for an efficient, modular motor controller capable of operating with a range of motor sizes and types. The wide applicability and low cost could result in substantial energy savings in industry, residential and hybrid vehicle markets. Under this project, Raser Technologies developed the FlexMod™ controller using Symetron™ technology. This motor controller design uses adaptive tuning to optimize performance based upon unique motor characteristics. The prototype drive can use various power modules and different IGBT designs. Advanced Energy tested the FlexMod™ controller and a comparable, commercially available controller on a 5 hp and a 20 hp AC induction motor. The tests produced a system efficiency map over 300 to 1800 rpm and 25% to 125% rated torque. The tests demonstrated that the FlexMod™ design was 2 to 10% more energy efficient on average.

In addition, Advanced Energy requested and was granted a no-cost contract extension from NASEO until December 31, 2006.

### Plans for Next Quarter

Advanced Energy, Raser, and Washington State University personnel are reviewing the draft for technical accuracy and proper reference documentation. Washington State University has agreed to contract terms for placing the results on their websites and including the information in appropriate search engines. Raser plans to highlight the report findings at their booth at the Electric Drive Transportation Association Conference in November as well as at other conferences in 2007.