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ENERGY SYSTEMS  
INTEGRATION FACILITY

U.S. DEPARTMENT OF ENERGY

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## Electrical Characterization Laboratory

Electrical Characterization Laboratory at NREL's Energy Systems Integration Facility (ESIF) focuses on the detailed electrical characterization of components and systems. This laboratory allows researchers to test the ability of equipment to withstand high voltage surges and high current faults, including equipment using standard and advanced fuels such as hydrogen.

### Laboratory Specifications

The Electrical Characterization Laboratory is 1,500 sq. ft. with a separate control room and exterior entrance to the building. It is designed as a safe and secure environment that can survive destructive testing of equipment. The separate control room provides a safe location for researchers with video links into the main test area. This room also has a separate ventilation system. The electrical service and testing area is designed to be Class 1, approved. The laboratory is outfitted with natural gas, hydrogen gas, nitrogen, and compressed air service. Facility liquid cooling and liquid heating loops are provided for connection to equipment. An integrated safety PLC (programmable logic controller) and SCADA (supervisory controls and data acquisition) systems with high-speed data acquisition and secure data storage are present.

### Application Scenarios

Equipment that interconnected to the electric power grid is required to meet specific surge withstand capabilities. This type of application tests the ability of electrical equipment to survive a lightning strike on the main grid. These are often specified in IEEE standards such as IEEE Std. 1547. In addition, this lab provides a space for testing new, unproven, or potentially hazardous equipment for robust safety assessment prior to use in other labs at ESIF. The Electric Characterization Laboratory is in a location where new, possibly sensitive or secret equipment can be evaluated behind closed doors.

### Partner with Us

Work with NREL experts and take advantage of the state-of-the-art capabilities at the ESIF to make progress on your projects, which may range from fundamental research to applications engineering. Partners at the ESIF's Electrical Characterization Laboratory may include:

- Equipment manufacturers
- Universities
- Other National laboratories

### Contact Us

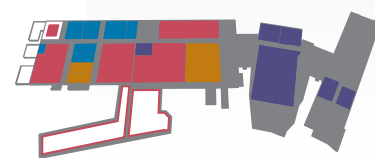
If you are interested in working with NREL's Energy Systems Integration Laboratory, please contact:

#### ESIF Manager

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### Major Laboratory Equipment

- High Current Surge Tester
- High Voltage Surge Tester



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NREL is a national laboratory of the U.S. Department of Energy  
Office of Energy Efficiency and Renewable Energy  
Operated by the Alliance for Sustainable Energy, LLC

NREL/FS-5500-52844 • October 2011

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