

## ABOUT GRAPES

GRAPES is a National Science Foundation Industry/University Cooperative Research Center established in 2009. The GRAPES Center's mission is to accelerate the adoption and insertion of power electronics into the electric grid in order to improve system stability, flexibility, robustness and economy.

## Facilities

### National Center for Reliable Electric Power Transmission (NCREPT) – University of Arkansas

Established for the purpose of investigating solid-state solutions for the electric power grid including protection devices and FACTS as well as energy storage and distributed generation applications.

#### Features include:

- Highest Power Test Facility on any U.S. University Campus
- Internationally Recognized, Award Winning Research (3 R&D Awards)
- Supports 3 Centers of Excellence
- 70 feet of Wall-Mounted 480 V/1200 A ac Busway
- 70 feet of Wall-Mounted 1500 V/1500 A dc Busway
- Server/IT Room Dedicated for Cyber Security Research Equipment
- 120 Ton Chiller
- 400 Sq. Ft. SCIF/Secure Room

### Center for Sustainable Electrical Energy Systems – University of Wisconsin–Milwaukee

This center brings together the capabilities of existing Laboratories and Centers within UWM College of Engineering & Applied Science to enhance the collaborations within UWM and with other groups and organizations. Major research and education areas of the center include power electronics, microgrids, energy storage, protection, very high voltage partial discharge and cybersecurity.

#### Features include:

- Three labs each over 5000 sq-ft, with 500kVA power supply (480V and 208V).
- Microgrid simulation with load and source controllers.
- Software includes MATLAB/Simulink, PSIM, PSS/E, PSCAD.
- Hardware-in-Loop setup with National Instrument PXIe Platform.
- Test equipment includes high power sources, oscilloscopes, analyzers, meters, probes.
- Generation sources: synchronous generators, dyno, AC/DC loads, solar PV, wind turbine, Li-Ion storage, natural gas generators.
- EMI testing facilities: Semi-Anechoic Chamber, Line Impedance Stabilization Networks, NI PXIe system.

## Our Focus

Advancing power electronics for grid-connected systems, developing new technologies for distributed energy resources, creating control software for embedded and grid-connected power electronics, and educating engineers in relevant technologies.

## Why Choose Us



**Access to Research Personnel**



**Access to students for GRAPES research, internships, and hiring**



**Access to cutting-edge university research facilities**



**Opportunities to network with other professionals in the power industry**



**Opportunities for technology transfer (non-exclusive IP development rights)**

# FACILITIES CONTINUED

## Electric Grid Laboratory – University of South Carolina

The Electric Grid Lab at the University of South Carolina is focused on two major topics: (i) High power, high voltage, and high frequency converter, and (ii) Energy management for electrical distribution system and bulk grid.

### Features include:

- Over 2000 sq-ft and over 500kVA power supply capabilities (three-phase 480 and 208)
- Full packages of MATLAB/Simulink, PSIM, PSS/E, and PSCAD
- Hardware in loop setups with National Instrument Compact RIO and Typhoon
- High power AC and DC sources, 2000VDC, 60kW, oscilloscopes with high voltage and high current probes, power electronics converters and devices

## South Carolina Energy and Power Testbed for Engineering Research (SCEPTER) Lab – University of South Carolina

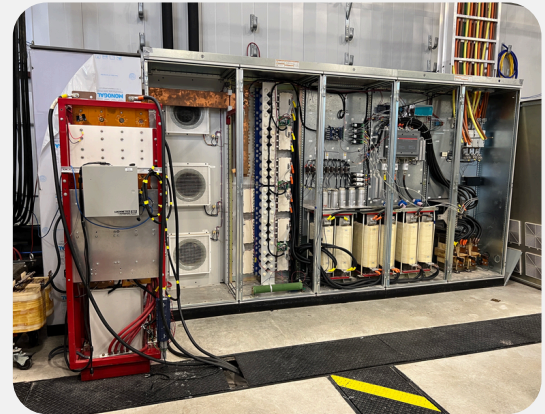
This lab is focused on digital twin develop for electric ships.

### Features include:

- Over 500kVA power supply capabilities (three-phase 480 and 208)
- Electric ship digital twin
- Generators, batteries, active and passive loads, converters
- High power AC and DC sources, oscilloscopes with high voltage and high current probes, power electronics converters and devices



An NSF Industry/University  
Cooperative Research Center



**NCREPT Facility**



**UWM Lab**



**USC Lab**

## MEMBERSHIP BENEFITS

**GRAPES Members benefit greatly from their membership in the center. Some of the major benefits are:**

- Members have non-exclusive rights to the entire GRAPES research portfolio under the conditions outlined in the Membership Agreement. This includes reports, papers, theses, dissertations, and all protected intellectual property generated by the center.
- All members have the opportunity to propose research ideas and focus areas for research. All IAB members are invited to work with researchers on the strategic planning work of the center, ensuring a constant focus on the most relevant issues in the power industry today.
- Members have an ongoing interaction with center personnel. Members receive information from the center through monthly email updates, semi-annual project review conference calls, strategic planning meetings, semi-annual face-to-face meetings, project webinars, and through direct interaction with GRAPES faculty and students.
- An opportunity to work with the graduate students who are the next generation of power engineers. GRAPES focuses strongly on IAB member interaction with students, aiding in both their preparation for industry challenges and providing networking opportunities for members!
- A significant leverage on the research dollars invested into GRAPES research. With 17 members and support from government agencies such as the National Science Foundation, GRAPES members can leverage their research dollars more than 17:1 in the GRAPES center.

### Current GRAPES Members



Arkansas Public Service Commission




Electric Cooperatives of Arkansas  
Your Local Energy Partners



Typhoon HIL



Eaton  
Powering Business Worldwide



Electronic Concepts



G&W



ITRI  
Industrial Technology Research Institute



KOHLER



DYNAMIC RATINGS



Entergy



SEMIKRON DANFOSS



WattEV



We Energies  
Energy You Can Depend On



KOONTZ  
Electric Company, Inc.  
OUR POWER IS IN OUR PEOPLE



MISO



Midwest Electronic Components



DRS Technologies  
A Finmeccanica Company