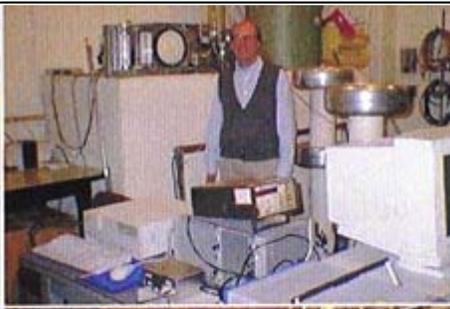


High Power Laboratory



Description:

This laboratory supports the development of materials, components and systems for application in the presence of very high electric fields or currents in electrical systems for various Air Force and DOD missions. There are three continuous DC power supplies in the lab (5MW capacity at 1kV, 5MW capacity at 400V, and 1MW at 12kV). There are three high voltage pulse generators; one capable of 1.5 MV, 1000 amp pulses, one with a variable pulse shape with a 400kV maximum voltage at low

current, and one capable of 160kV, 150,000 amp pulses. These high power supplies support a variety of R&D tasks, including development of high current conductors and magnets, electromagnetic transient generation, and research on high power components and subsystems. An extensive capability exists for the analysis of partial discharge breakdown of dielectric materials and pulsed system components. 30kV DC and a 150kV rms, 0-1800 Hz power supplies produce the extremely low harmonic noise output required for partial discharge and corona research. Highly sophisticated data acquisition systems allow the analysis of experimental data.

Purpose:

Characterize performance/identify aging mechanisms in advanced solid, gas and hybrid insulation systems subjected to pulsed or continuous voltage stress in extreme low pressure environments. Model/synthesize electromagnetic effects on air and space vehicles' internal electrical systems. A test-bed for full load, high power, multi-megawatt DEW power conditioning equipment. Conduct performance verification on high power components/subsystems via unique high voltage/high current power sources, along with high power passive load facilities.

Products:

- Component Insulation Evaluation (atmospheric and sub-atmospheric)
- Electromagnetic Transient Susceptibility Evaluation
- Superconducting Magnet Evaluation
- Research results: Technical reports, papers, journal articles
- Design Guides for Space Applications (joint with NASA)
- International Test Standards (IEEE, IEC, etc.) for partial discharge and corona testing (international technical committee participation)

Availability:

Primarily in-house research and verification testing. U.S. Government agency use, DoD contractors, State-funded research efforts (OAI/DAGSI), dual use/defense conversion, CRADA efforts: use-limited on an as available basis.