Title	**Smart Grid Test Facility**
Technical areas	Circuits, electronics, electric power, green energy
Customer's Project Description	The purpose of this project is to design and build a test bed that can be used in undergraduate and graduate courses and energy research. The system should consist of at least three (or more) simulated 60-Hz AC generators that operate at about 12 VAC (This voltage will be far safer than the usual 13-kV found in most generating plants.). The "prime movers" for each generator (simulated coal, gas, hydro, or nuclear fueled steam or gas turbine engines) should be some form of DC motor that derives power from a large DC power supply (to be supplied by customer). The generators should interconnect via a lumped-element (RLC) grid that simulates the large-scale transmission lines that interconnect all the generators in the national utility grid. The grid should include points where loads can be applied (both real and reactive), and include connection points where green forms of energy (solar, wind, ocean) can also be connected to the grid. The system should have data acquistion to provide real time data of the voltage, current, and power factor, and power flow to/from each generator and load in the network. Note: Designing simulated green energy sources will be optional for this project.
Deliverables	Bench-top test bed for smart grid experiments, real and reactive loads, load flow data acquisition system
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Customer's Supplied Items	Large DC power supply to run the prime-mover motors, thereby acting as the source of energy for the generators (simulating existing fossil, hydro, and nuclear fuel sources).