

TEXAS ENGINEERING

AUTOMATED GRID DISRUPTION RESPONSE SYSTEM

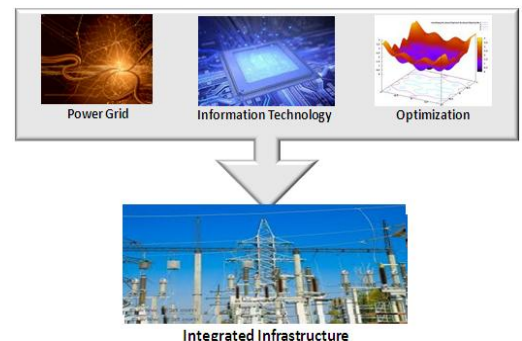
PROJECT TITLE:	Robust Adaptive Topology Control (RATC)		
ORGANIZATION:	Texas Engineering Experiment Station (TEES)	LOCATION:	College Station, TX
PROGRAM:	GENI	ARPA-E AWARD:	\$ 4,239,062
TECH TOPIC:	Electricity Transmission & Distribution	PROJECT TERM:	3/1/12 – 3/1/15
WEBSITE:	tees.tamu.edu		

CRITICAL NEED

The U.S. electric grid is outdated and inefficient. There is a critical need to modernize the way electricity is delivered from suppliers to consumers. Modernizing the grid's hardware and software could help reduce peak power demand, increase the use of renewable energy, save consumers money on their power bills, and reduce total energy consumption—among many other notable benefits.

PROJECT INNOVATION + ADVANTAGES

The RATC research team is using topology control as a mechanism to improve system operations and manage disruptions within the electric grid. The grid is subject to interruption from cascading faults caused by extreme operating conditions, malicious external attacks, and intermittent electricity generation from renewable energy sources. The RATC system is capable of detecting, classifying, and responding to grid disturbances by reconfiguring the grid in order to maintain economically efficient operations while guaranteeing reliability. The RATC system would help prevent future power outages, which account for roughly \$80 billion in losses for businesses and consumers each year. Minimizing the time it takes for the grid to respond to expensive interruptions will also make it easier to integrate intermittent renewable energy sources into the grid.



IMPACT

If successful, the RATC system would protect the grid from costly interruptions and enable renewable sources of electricity generation to continue supplying power.

- **SECURITY:** A more efficient, reliable grid would be more resilient to potential disruptions from failure, natural disasters, or attack.
- **ENVIRONMENT:** Enabling increased use of wind and solar power would result in a substantial decrease in carbon dioxide (CO₂) emissions in the U.S.—40% of which are produced by electricity generation.
- **ECONOMY:** A more efficient and reliable grid would help protect U.S. businesses from costly power outages and brownouts that stop automated equipment, bring down factories, and crash computers.
- **JOBS:** Advances in grid software could result in new high-paying jobs in supporting sectors such as engineering and information technology.

CONTACTS

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