Advanced Research Projects Agency • ENERGY

GENI PROJECT

GENERAL ATOMICS

LOW INSERTION HVDC CIRCUIT BREAKER

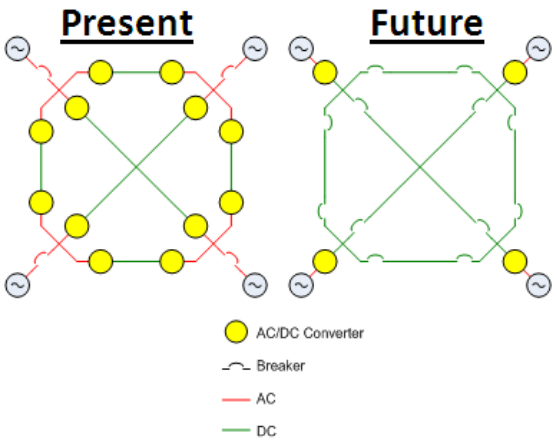
PROJECT TITLE:	Magnetically Pulsed Hybrid Breaker for HVDC Power Distribution Protection		
ORGANIZATION:	General Atomics	LOCATION:	San Diego, CA
PROGRAM:	GENI	ARPA-E AWARD:	$2,515,673
TECH TOPIC:	Electricity Transmission & Distribution	PROJECT TERM:	1/9/12 – 1/8/14
WEBSITE:	www.ga.com		

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The U.S. electric grid is outdated and inefficient.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

General Atomics is developing a direct current (DC) circuit breaker that could protect the grid from faults 100 times faster than its alternating current (AC) counterparts. Circuit breakers are critical elements in any electrical system. At the grid level, their main function is to isolate parts of the grid where a fault has occurred—such as a downed power line or a transformer explosion—from the rest of the system. DC circuit breakers must interrupt the system during a fault much faster than AC circuit breakers to prevent possible damage to cables, converters and other grid-level components. General Atomics' high-voltage DC circuit breaker would react in less than 1/1,000th of a second to interrupt current during a fault, preventing potential hazards to people and equipment.



IMPACT

If successful, General Atomics' DC circuit breaker would improve the stability of the grid by instantaneously insulating it from damage in the event of a fault.

- SECURITY: A more efficient, reliable grid would be more resilient to potential disruptions from failure, natural disasters, or attack.
- ENVIRONMENT: Protecting the grid from damage and disruption will improve its efficiency, waste less fuel, and eliminate the release of additional greenhouse gases. 40% of carbon dioxide emissions come from 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 hardware could result in new high-paying jobs in supporting sectors such as engineering, manufacturing and service.

CONTACTS

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