

Real Power Regulation for the Utility Power Grid via Responsive Loads

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Technology Summary

A new methodology for dynamically managing an electrical system was invented by researchers at ORNL. Balancing power generation with load demand is critical to ensuring a stable and reliable power supply. This invention provides a new solution to power regulation that can eliminate operational inefficiencies and potentially save the utility industry significant energy generation costs each year.

Balancing power generation is currently achieved by power generators that modify their output in response to varying load demand. However, generators must be responsive to control signals, making it difficult for utilities to accommodate variable power demands while maintaining a continuous and instantaneous balance. These inefficiencies can cost utility companies and consumers up to \$2 billion per year. By using controllable loads to regulate and maximize power generation, this technology offers a faster and more accurate response than current generators and technologies.

By allowing an operator to send control signals that direct responsive loads to move incrementally up or down or to a total set amount, the method provides an efficient system of power regulation or spinning reserve to the power grid. With these control signals, the power may direct the responsive load to move power incrementally, or to adjust the load to a specific power level in order to provide power system balancing.

Advantages

- Provides a continuous and instantaneous balance of power generation
- Requires minimal capital outlay
- Saves significant energy generation costs each year

Potential Applications

- Utility companies
- Manufacturers of equipment sold to utilities to maximize the efficiency power generation

Patent

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