Researchers at the University of South Florida have discovered a way to simultaneously regulate frequency and economic dispatch of power systems.

Currently, power balance is a constraint that must be monitored in power systems. These power systems are often controlled by distributed optimization applications represented by algebraic equations. These control systems take time to converge, and cannot be fine tuned to the specific system they are controlling. There is a need for power systems to be controlled in a faster and more economic way.

USF inventors have found that if the power imbalance is represented by frequency deviation, an iterative dual decomposition based economic dispatch solving is equivalent to integral control, and an iterative method of multipliers based economic dispatch is equivalent to proportional integral control. The parameters of the feedback control for each generator (input: frequency deviation, output: turbine-governor’s power reference) can be selected, according to generator cost functions. This selection achieves economic operation and frequency regulation simultaneously, which also decreases time. This novel technology has multiple applications across the power industry.

**ADVANTAGES:**
- Economic operation
- Better alternatives for frequency regulation
- Improved system power balance

**Dynamic System Modeling and Control of Power**