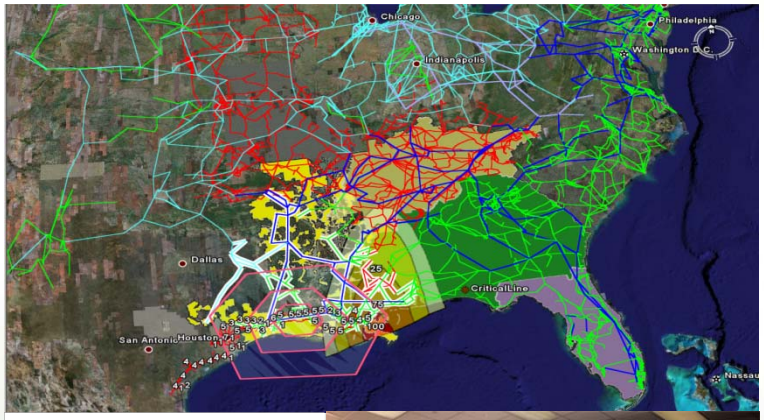
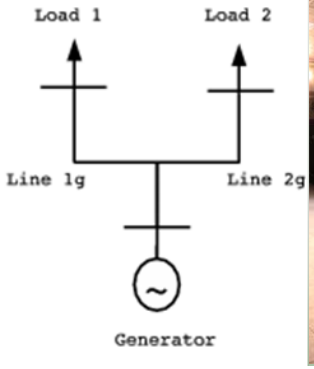
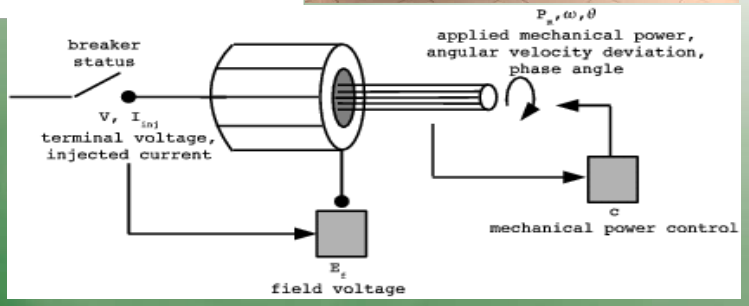
A virtual power system enabled by ultra-scale computing

Modeling and Simulation Group

Computational Sciences & Engineering Division







Problem Statement:

- **Advanced sensing and actuation technologies are changing how power grids are monitored and controlled. In the next ten years, hundreds of PMUs, thousands of F-Net sensors, and millions of advanced meters will be deployed by utility companies. This presents an opportunity for systemic improvements in the national power system and new engineering challenges as industry strives to realize this potential.**

Technical Approach:

- **ORNL is building large scale, high performance simulations of the national power grid. These models have the geographic extent and scope of detail necessary to understand the impacts of modern sensing and control, renewable and distributed generation, and other high consequence technologies. ORNL's simulators will be a test-bed for new concepts and technologies in power grid operations.**

Benefit:

- **With a simulated power grid, the benefits and risks of advanced technologies can be assessed before they are fielded, and thereby inform decisions by and mitigate risks to energy providers, energy consumers, and to the nation as smart technologies are developed and deployed.**

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