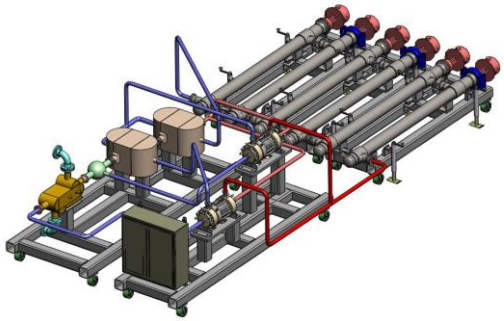
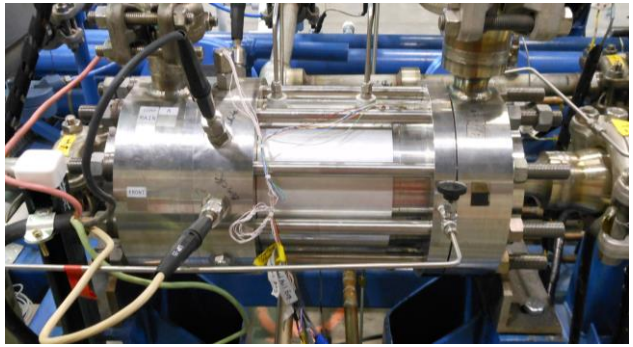
Exceptional service in the national interest

Sandia National Laboratories





S-CO2 Brayton Cycle Mission

Gary E. Rochau

Advanced Nuclear Concepts

Technical Area Lead for Energy Conversion

DOE Advanced Reactor Technologies

U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

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SANDIA's Brayton Mission

"By the end of FY 2019, Sandia National Laboratories shall develop, with industry, a fully operational 550˚C-10 MWe R&D Demonstration SCO_2 Brayton Power Conversion System that will allow the systematic identification and retirement of technical risks and testing of components for the commercial application of this technology."

Mission System Attributes

- **Re-configurable**
  - alternative configurations
  - system components
- **Formal systems engineering**
  - identification and retirement of technical risks
    - Phase 1: establish a foundational technology
    - Phase 2: higher power levels and temperatures
- **Demonstrate SNL's capability:**
  - Assist industry
  - Graded approach using applicable scientific and engineering rigor
  - Address development and maturation risks
    - Power on the grid
    - Reduce water
    - Reduce carbon emissions
    - Reduce capital costs based on "industry pull."

Strategic Goal - Breakthrough Power Generation

- ***Strengthen our nation's energy security posture by (1) demonstrating the viability of future nuclear energy advances to meet growing electricity demands while reducing greenhouse gas emissions and (2) developing, demonstrating and commercializing transformative energy conversion technologies***
  - **Commercialize a SCO_2 Brayton Cycle System**
  - **Establish SCO_2 Brayton Cycle as a DOE-wide cross-cut technology**