Sandia National Laboratories - Federal Agency Energy Surety Support and Integration Capabilities

Interagency Energy Management Task Force Meeting
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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy’s National Nuclear Security Administration under contract DE-AC04-94AL85000.
Sandia Renewable Energy Research and Development Focus Areas

6337
Concentrating Solar
Jeff Nelson

6335
PV and Dist. Gen Testing
Charlie Hanley

6333
Wind Energy
Jose Zayas

6331
Geothermal Research
Doug Blankenship

6336
Storage and Dist. Gen
John Boyes

6332
Energy System Analysis
Juan Torres

6338
Fuels & Fuel Cells
Ellen Stechel
Sandia Energy System Research and Integration Focus

- **Energy System Surety**
  - Improve energy system safety, security, reliability
  - Grid-tied and/or islanded control and operations of distributed generation
  - Utility and facility-scale system design, engineering, and implementation

- **Integration of all energy resources**
  - Renewable, fossil, nuclear
  - Distributed (<3Mw) or grid-scale (>5Mw) applications

- **Experience with a range of federal agencies**
  - DoD, Park Service, USCG, BoR, BPA, TVA, BLM, etc......
Sandia Risk Assessment Approach to Energy System Improvements

Risk = \( P_A \times (1-P_E) \times C \)

- Characterize Facilities
- Define Threats
- Determine Consequences
- Identify Safeguards
- Analyze System
- Make Changes & Reassess

Compare to System Protection and Performance Goals

Risk

Sufficient Protection?

Y

N

End Until Change
Sandia Distributed Energy Technology Lab
Integration Testing and Evaluation

Center for Control System Security

Grid

480V Microgrid

Remote DER sites

Distributed Energy Resources

Various Loads
New DOE/Sandia Initiatives of Interest to Federal Agencies

- **Solar Energy Grid Integration System (SEGIS)**
  - Research and development of next generation solar energy management, communications, and load control

- **Solar America Initiative (w/NREL)**
  - Three major areas – showcases, cities, government installations
  - Assistance for technology decisions, financing, grid integrations, storage, etc.

- **DOE/DoD Microgrid Development**
  - Support military bases in developing conceptual designs for energy surety microgrids