EAC REPORT
on
DOE GRID MODERNIZATION INITIATIVE

NEW TECHNOLOGIES REQUIRE A MODERN GRID

REPORT STRUCTURE

- Introduction (1/2 page)
  - Evolution of the Grid Modernization Initiative
- Observations on Grid and Grid Research (1 page)
  - Why Grid Research is different than component research
- Recommendations (1.5 pages)
  - To strengthen and further focus the MYPP
- Conclusion (1/4 page)
  - Grid research is critical to national infrastructure

INTRODUCTION

- Grid is a critical infrastructure and facing challenges
  - Natural threats from storms, climate change
  - Physical and Cyber threats
  - Rapidly evolving technology – new generation mix, electronics, information
- Evolution of the Grid Modernization Initiative
  - The Quadrennial Energy Review (2015, 2017)
  - The Quadrennial Technology Review (2015)
  - Grid Modernization Multi-Year Program Plan (2016)
  - Grid Modernization Laboratory Consortium (2016) - 88 Projects
- EAC strongly supports increase in Grid Modernization R&D

OBSERVATIONS ON THE GRID

- The Grid is a System of thousands of Components
- System Research is different from component research – efficiency, reliability, flexibility, resiliency
- System issues are planning, operation, control, analysis and simulation
- Grid resiliency, flexibility, security are a public good – R&D has to be funded by the federal government (DOE)
- Grid system testing can mostly be done by large scale simulation – R&D must include the establishment of large scale simulation and testing platforms

RECOMMENDATIONS

- Development of Research and Smart Grid Workforce
- Simulation platforms to support planning, operation, control of large systems
  - Large scale simulation centers with real and synthetic data bases for testing
  - Platforms have to be layered to include not just gen, trans, distr but also sensors, comm, computers, protection and controls
- Testing labs for subsystem and component technologies
  - Hardware in the loop testing
  - Use the regional demos as pilots
- System Technologies vs Component Technologies
- Needed policies for Grid Modernization

CONCLUSION

- The grid is a critical infrastructure for the nation
- The grid is a system of thousands of components
- The resiliency, security, efficiency of the whole grid is a public good
- The development of the methodologies for the planning, design, operation and control of the grid is of national interest
- The R&D needed for transforming the grid is qualitatively and quantitatively different from the R&D of the component technologies
- The modernization of the grid is necessary because electricity generation and consumption is continually changing