

EAC REPORT on GRID MODERNIZATION

OUTLINE

Report Structure

- Executive Summary (2-3 pages)
- Introduction (2-3 pages)
 - Evolution of the Grid Modernization Initiative
- Overview of GMI Projects (2-3 pages)
 - GMLC projects
- Grid as a System of Components (2-3 pages)
 - Planning, Operation, Flexibility, Reliability, Economy, Resiliency, Security, etc.
- Recommendations (2-3 pages)

Recommendations

(limit to few major ones)

- The MYPP is on target
- 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
- Subsystem/technologies can be tested with software-hardware labs
 - Hardware in the loop testing
 - Use the regional demos as pilots
- Impact on the Grid of New Technologies
 - Storage? Transformers? FACTS?
- Needed policies to meet technology adoption challenges

Grid as a System of Components

- System Research is different from component research – efficiency, reliability, flexibility, resiliency
- System issues are planning, operation, control, analysis and simulation
- System testing is mostly by large scale simulation
 - Co-Simulation of various systems like transmission, distribution, communications, fuel supply, etc. remains a challenge
 - Simulation platforms that can inter-operate do not exist
- Subsystems or components can be tested with hardware or hardware in the loop

GMMLC Projects (2-3 pages)

- 6 Foundational Projects
- 13 Crosscut Projects
- 10 Regional Partnerships
- Rest Program Specific Projects
- Regional Demonstrations in Plan

INTRODUCTION

(2-3 pages)

- Evolution of the Grid Modernization Initiative
- The Quadrennial Energy Review
 - First Installment (April 2015)
 - One Chapter on Electricity
 - Second Installment (Jan 2017)
 - All on Electricity
- The Quadrennial Technology Review (2015)
 - One Chapter on Grid Modernization
- Grid Modernization Multi-Year Program Plan (2016?)
- Grid Modernization Laboratory Consortium (2016)
 - 88 Projects

EXECUTIVE SUMMARY

(2-3 Pages)

- Recent History – QER/QTR/MYPP/GMLC
- Grid as a System of Components
- GMLC Projects
- Summary of Recommendations

The Tone of Report is Important

- 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