SMART GRID COMMITTEE UPDATE

MARCH 10, 2022

INITIATIVES

- Past Achievements
    - Pathways 8008
    - Big Data
    - State/Federal Coordination
- Future
    - Pathways 8008
    - Advanced Grid for DER Integration
    - Transmission Planning for Renewable Integration Resiliency/Flexibility
    - Electric Vehicle Integration
    - Resiliency

MODEL PATHWAYS 8008

- Meeting since August 2021
  - Draft Document Completed
  - Coordinate with EAC to create a recommendation document to DOE

ADVANCED GRID FOR DER INTEGRATION

- Recommend that DOE perform an analysis to determine the essential functional requirements, and needed grid capabilities/systems and associated $ under the following scenarios:

  - Traditional grid (i.e., power flows from central generators to customers)

  - Distributed grid (scenario A): electric utility owns assets and oversees sensing, control, coordination.

  - Distributed grid (scenario B): shared responsibility of grid ownership between utility and customer/3rd-parties (including microgrids) with a need to understand systems required for sensing, control, and coordination.

  - Scenario B including T/D coordination.

- Still appropriate?

Services Provided			Provided by "Utility" Via			
System Design, Operation, and Maintenance	Service Description	Distribution	Transmission	Generation	Customer Option to Provide if disconnected from Grid	Consequences if not provided for
Generation Services						
Energy and capacity	Having suffucent resources available energy needs, all hours of all days			G	Solar, Fuel Cells, Storage (multiple technologies likely required)	Power outages
Load generation balance	System to match the real time energy needs with a resoure			G	Advanced Control system	Power surges, outages
Provide for future growth	Having resources and facilities available and adequately sized should load at ths location increase by any amount	D	T	G	Add more panels, batteries, and inverters, however ability to match resources with demand wil be limited	Abilty to meet loads will be limited to existing capability
Frequency regulation	Maintain system frequency at 60Hz (required by electronic components)			G	Advanced Control system	Damaged appliances & electronics
A/C & motor startup	Provide extra capacity when A/C's and other motors first start	D	T	G	Smart Inverter + Oversized system	A/C and motors may stall out, damaging the unit and causing power outages
Voltage Regulation Services						
VAr support	Provide stored energy to support the grid after significant outages	D	T	G	Smart Inverter + Oversized system	Power outages, dimming lights, damaged appliances & electronics
Voltage regulation	Keep voltage in a specified bandwidth	D	T	G	Smart Inverter	Damaged appliances & electronics & lighting
Power Quality	Mitigate voltage spikes and harmonics	D			Advanced Control system + Storage	Flickering lights, damaged appliances & electronics
Reliability Services						
Outage scheduling	Schedule system maintenance and provide alternate service options during maintenance	D	T	G		
Redundancy	Provide multiple sources of energy	D	T	G	Second Inverter + oversized system + multiple feeders	Without a second, standby system, customer has no electricity until new parts are delivered and installed. Potentially weeks or months.
Component failure	Immediately replace/repair equipment from stock on hand in case of failure	D	T	G		
Equipment replacement	Proactively replace aging equipment	D	T	G		
Outage restoration	Restore service after an outage	D	T			
Resiliency Services						

TRANSMISSION PLANNING FOR RENEWABLE INTEGRATION RESILIENCY/FLEXIBILITY

- Coordination of planning, operations, and markets across jurisdictions

- Planning tools and analytical methods needs for operation every hour of the year, 8760 load, generation and weather profiles

- Identification of system needs

ELECTRIC VEHICLE INTEGRATION

- Technology adoption and barriers

- Data sharing and interoperability

- Charging infrastructure rollout

RESILIENCY

- Agreed to tackle
  - Techniques for improving resilience
  - Infrastructure interdependencies
  - Advanced grid solutions
  - Coordinate with GRNS