**CONFIDENTIAL Issue Brief**

April 7th, 2015 Electricity Disruption Event in the NCR

**Background**

On April 7th, 2015, at about 12:30 pm, a 230KV electrical transmission line serving the Pepco system failed and fell at the Southern Maryland Electric Cooperative's (SMECO) Ryceville power substation causing an electrical short and small fire at the substation. Charles County Fire & EMS quickly extinguished the fire. Cause of the electrical line failure is under investigation. The loss of the electrical line and the substation event caused the transmission system to respond to protect critical equipment (sectionalize the problem, power redirected, fuses tripped, power plants shut down). The event also caused issues with voltage on the overall transmission system providing electrical power to Washington, DC. The dip in voltage also caused equipment at some customer facilities to automatically transfer to their backup systems. Other facilities across the District experienced a brief flicker of lights and equipment. Some of the outage reports from around the region included: several major metro stations in DC and Maryland, Union Station and Amtrak went onto backup power and lost main power, federal facilities went onto backup power systems (including White House, State Department, US DOE, Smithsonian Museums, US Capitol); and fire and rescue had to assist riders stuck in an elevator on the University of Maryland Campus.

Initial reports from PJM, the organization responsible for managing the electrical transmission system across 13 states and the District of Columbia, were that “a major disturbance on the transmission system in the Pepco area caused several power plants and transmission lines to shut down. As a result, some retail customers lost electric service. Local utilities will have details on those outages. At the transmission level, the outages of customers equaled between 200 and 500 megawatts of power. The problems seem to be limited to the D.C.-Maryland area. PJM and local utilities are restoring power supplies and electric service. The transmission grid is stable. The cause of the disturbance is under investigation. Three generating units (power plants) shut down, totaling about 2,000 MW. No other information has been confirmed at the grid level.

Initial Reports from Pepco were “shortly before 1pm Tuesday we experienced a dip in voltage in the Washington D.C. area. This was caused by an issue with a transmission line.  There was never a loss of permanent electric supply to customers.  The dip in voltage caused equipment at some customer facilities to transfer to their backup systems.  The momentary outage occurred because of customer equipment responding to a dip in voltage.  We are currently working to repair the transmission equipment fault in Charles County, Maryland.  We have crews on site investigating the cause.”

Organizations actively interested in or investigating the event include the Maryland Energy Management Agency (MEMA), DC HSEMA, DC and Maryland Public Service Commissions, the North American Electric Reliability Corporation (NERC), the Federal Energy Regulatory Commission (FERC), Pepco, PJM, and SMECO. Event analysis reports being developed by PJM and NERC are anticipated to be complete between the end of May and July. Given sensitivity and confidentiality concerns, it is not clear yet whether details of these reports may be shared.

**Issues/implications for the Region**

Why did this cause problems at critical facilities in the region?

* Critical facilities had capability to detect voltage issues with the distribution system and automatically move to run on backup power systems.

Does this incident indicate a systemic problem in the electric transmission and distribution system?

* There is no systematic problem in the electrical transmission system. However, this incident demonstrates several important considerations:
  + The interconnectedness of the electrical distribution system, and the overall reliance of critical and non-critical facilities on uninterrupted power.
  + Ability for the system to automatically and very quickly prevent damage by redirecting power flows, closing circuits, switching to backup power.
  + The reliance of the NCR on a major and expansive network of transmission and distribution equipment.

What is the likelihood of a similar event happening again?

* It is probable that similar events will occur on the transmission and distribution system at some point in the future; however, events such as this are not anticipated to occur with any sort of regular frequency if the system is properly maintained and managed. Electrical power outages can be caused by a number of different factors. While most are familiar with outages caused by falling limbs, ice, and storms, disruptions can also be caused by system anomalies caused by voltage and power flow issues on the larger system. Some considerations:
  + continued investments are needed to maintain or modernize electrical system infrastructure.
  + a highly trained workforce is needed to manage the electrical transmission and distribution system.
  + regulatory and industry oversight is needed on an on-going basis to implement policy and procedures to mitigate the chances of system disruption.

**Questions/Discussion Framework**

What risk does our region face?

* The region is reliant on a complex electrical power system. Failure of or anomalies on the system can impact public and private missions and operations. Some parts of the system are aging and may require significant investment to maintain, upgrade, or modernize. Critical facilities need to continue to invest in and maintain capability to ensure power quality and supply. The public needs to invest more in preparedness. Even with all these actions, disruptions of power can and do happen, and operations can be disrupted.

What can be done to mitigate the risk?

* Utility investment in upgrading and modernizing the electrical system.
* Professional investigations with recommendations on new policies or procedures to address vulnerabilities
* Maintenance and testing of on-site backup power generation systems
* Investments in new on-site power generation, including the deployment of advanced microgrids

What is the role of public bodies (state and local governments) – staff and elected officials?

* States have regulatory oversight of public utilities and can work with power providers to enable cost recovery for investments in system needs. Governments and other owners/operators of critical facilities can invest in back-up power systems and on-site sources of power. NERC, with oversight from FERC, has the ability to conduct investigations, determine compliance with standards, and recommend new standards to address system reliability issues.