UGI Utilities, Inc. – Electric Division
Electric Reliability Outlook & Summer Readiness for 2021

Summary

UGI Utilities, Inc. (UGI) continues to review and implement programs aimed at improving our summer readiness with respect to providing safe and reliable service during peak summer loading conditions and to minimize customer outages and restoration times during the summer storm season. The programs that UGI currently has in place and the programs and initiatives currently under review are discussed below.

I. Reliability Enhancement Programs

a. Enhanced Vegetation Management

UGI's existing Danger Tree Mitigation Program, continues to address the vegetation issue caused by the Emerald Ash Borers devastation of Pennsylvania's ash trees. The Danger Tree Mitigation Program identifies and addresses mainly off right-of-way trees that pose a threat to transmission and distribution facilities. In addition, UGI continues the practice of "ground to sky" trimming on multi-phase circuits and on single phase lines where appropriate. For 2021, UGI has increased vegetation resources to supplement regular trim cycles as outlined in our maintenance plan.

b. Storm Hardening

UGI's initiatives relative to storm hardening are designed primarily to reduce the number of outage events and extent of damage caused by vegetation. Outside of the Vegetation Management Program, several initiatives are ongoing to mitigate such risks. One such initiative is the practice of using Class 2 or Class 3 Wood Poles when replacing or installing new poles on its distribution system. On its transmission system, steel, Class 1 or Class 2 poles are standard for replacement or new structures. Also, UGI continues its Primary Line Relocations Program to move distribution lines from troublesome off-road locations to roadside right-of-way. Relocating the lines to roadside enables more efficient and safer patrolling and restoration.

c. Fuses/Recloser/Automatic Switches

As part of its Long Term Infrastructure Improvement Plan (LTIIP), UGI continues its Line Sectionalizing Program which focuses on identifying locations to install fuses, disconnects, and other devices to limit the number of customers affected when line damage occurs and enable field personnel to restore service to customers on unaffected line segments through switching before repairs are made. In Fiscal 2021, UGI expects to add thirty-one (31) new sectionalizing points, including fuses and solid blade disconnects, as part of its annual sectionalizing plan. In addition, UGI's automation

program, which is discussed further below, plans to install twenty-six (26) three-phase reclosers throughout this year.

d. Smart Grid

As part of its Long Term Infrastructure Improvement Plan (LTIIP), UGI continues to extend remote monitoring and control via wireless communication links to 3-phase reclosers on select feeders through-out the system. UGI installed a Distribution Supervisory Control and Data Acquisition (DSCADA) system that will leverage its growing number of Distribution Automation devices and substation data concentrators. To date, seventy-seven (77) reclosers are accessible to system operations and another twenty (20) are planned to be added by the end of Fiscal 2021. All fourteen (14) of UGI's 13kV voltage regulators are currently remotely accessible. To prepare for remote communication to capacitor banks, UGI currently upgraded thirty-four (34) of one-hundred and sixty-one (161) distribution capacitor bank controls and continues upgrading roughly twelve (12) per year. Remote management of these devices, by UGI System Operators, will significantly reduce switching times to sectionalize, restore customers impacted by outages, and provide reliable voltage support during peak loading conditions. UGI is preparing for a future FLISR (Fault Location, Isolation, and Service Restoration) automation control system to improve restoration times with automated switching.

e. Conservation Voltage Reduction (CVR) activity

UGI does not currently engage in Conservation Voltage Reduction activity.

f. Any Other Relevant Continual Improvement Activity

UGI's Long Term Infrastructure Improvement Plan (LTIIP) was approved by the Pennsylvania Public Utility Commission (PUC) in December of 2017. UGI identified five key areas of investment: Major System Improvements, Pole replacement, Sectionalizing/Distribution Automation, Underground Cable Replacement, and Substation Equipment. In each of these areas, UGI continues to target and replace or add equipment that provides the largest reliability benefits.

UGI has continued a 66kV air-break motorization program. This program is designed to motorize key 66kV air-breaks providing control from UGI's Control Center. In Fiscal Year 2020, four (4) 66kV Motor-operated Air-Breaks were installed and added to the transmission SCADA. Three (3) more are planned to be completed in Fiscal Year 2021.

g. New programs/new technology implementation/storage pilots, etc.

UGI is planning to install several stand-alone weather stations within its service territory to assist in future outage prediction and storm modeling.

UGI is replacing its current Outage Management System (OMS) adding functionality for dispatchers, management and field users, such as enhanced dispatch functionality, mobile damage assessment tools, and business intelligence.

II. Preventative Maintenance Programs

In conjunction with its Biennial Inspection, Maintenance, Repair, and Replacement Plan as filed with the Commission, UGI Electric Division has the following additional programs geared toward enhancing the reliability of service it provides its customers.

a. Capacitor Inspections

UGI performs an annual inspection of all capacitors on its distribution system. The inspections include a visual inspection to identify blown fuses and general condition, operation of switched capacitor controls and recording voltage checks.

b. Vegetation Management

UGI performs a vegetation management inspection on all its primary overhead distribution facilities every two years. Approximately half the circuit mileage will be inspected each year. The purpose of the vegetation management inspection is to assess the condition of vegetation on and off right-of-way to identify situations that may pose a threat to reliability of service or damage the overhead distribution facilities. In addition, UGI has established expected vegetation line treatment cycle times for its distribution circuits. The vegetation line treatment involves pruning or removal of trees on its system and to chemically treat areas on its distribution lines and right-of-way.

c. Substation Inspections

All UGI substations are visually inspected at least monthly. These inspections include both a physical security and general equipment review. Intrusive inspections and/or diagnostic tests are made on all substation equipment on a periodic basis with corrective maintenance or replacement performed to address identified deficiencies. On a semi-annual basis (summer & winter) all substations undergo an infrared inspection to identify any thermal anomalies associated with connections, fuses, control cabinets, etc.

d. Aerial Patrols

UGI completes an annual aerial Light Detection and Ranging (LIDAR) assessment of our 230kV transmission facilities to identify any potential vegetation or encroachment concerns.

Every 3 years, an aerial patrol of the UGI 230kV transmission system is completed in which a visual inspection is performed with respect to wire, insulators, structures etc. and areas of concern are photographed and reported for follow-up work.

e. Infrared Inspections

UGI has added infrared inspection to the biennial overhead line inspection program.

As stated above, UGI completes a semi-annual (summer & winter) infrared inspection of its substation equipment.

f. UAV (drone) use

UGI has implemented a pilot program using unmanned aerial vehicles to assist in vegetation patrols in right-of-way and pole top and crossarm inspections.

g. Any other relevant continual improvement activity

Overhead voltage regulators and their controls are removed from service and maintained on a fixed periodic basis.

An intrusive inspection is made on all underground line terminal equipment and a neutral integrity test is performed on all line segments on a fixed periodic basis. Corrective maintenance or replacement is performed on deficiencies identified during these inspections.

h. New Programs/New Technology Implementation

UGI continues to utilize and explore emerging technologies to enhance current preventative maintenance programs. For this reporting period, UGI did not implement any new programs or technology.

III. Capacity Planning

Based on the forecasted summer peak load, UGI does not expect any significant issues with respect to capacity from a transmission or distribution perspective. UGI performs annual planning studies and reviews transmission, substation and feeder loading under various

contingencies for compliance with UGI planning and reliability criteria. Delivery system capacity expansion plans are made based on these study results. The UGI 2020 summer peak was 208 MW's which is 2.8% less than the all-time summer peak of 214 MW's. The 2021 summer peak is expected to increase over 2020 due to a significant increase in commercial development/load within and around UGI's Hanover Industrial Park (HIP). To address this localized increase and to plan for proposed future development in the surrounding area, UGI completed construction of two new distribution feeders supplied from the Loomis substation. Other distribution and transmission system improvements in this area and others are in the design process or under construction for future anticipated growth.

IV. 2020/2021 Storm Update and Lessons Learned

UGI did not experience any weather-related Major Events, as defined by PA Title 52 § 57.192, which are reportable to the Commission, in 2020. UGI had one (1) Major Event Day (MED), as defined by IEEE Standard 1366-2012, in 2020 and one (1) MED to date in 2021. The weather factor primarily accountable for both MEDs was sustained periods of wind with gusts up to 45-50 mph. Based on these and previous events, UGI has undertaken several initiatives to improve system reliability;

- The Company typically schedules a Saturday duty truck as well as two full-time "trouble-man" during weekdays to provide quick response to service interruption calls. To bolster response times later in the afternoon and evening, UGI is currently in the process of hiring a second shift trouble-man. Call-out rosters are also in place to mobilize staff when service/line personnel are not on duty or when additional resources are required.
- UGI implemented a contractor standby process on weekends to improve response times to emergency events.
- Pursued prearranged agreements with line construction contractors in order to expedite the on-boarding of mutual assistance aid for events that exceed UGI's resources.
- UGI trained personnel from its gas division to perform a wire guarding role to assist the electric utility during large storm restoration events.
- UGI implemented Everbridge notifications to mass contact employees during a major storm event. The system will place a phone call and send a text alerting the employees of system trouble and requesting a response that the message was received.

V. 2021 Summer Readiness

a. Capacity Additions

UGI continues studying its capacity requirements and when limitations are identified UGI will increase its capacity as required.

b. Transmission Preparedness

UGI performed the annual planning review of the transmission system utilizing current and forecast load flow models to identify any voltage or thermal criteria violations. Results of the analysis did not indicate any issues under the various contingency scenarios that are not currently being addressed.

c. Event Preparedness

UGI continuously monitors the weather forecasts for severe events. When threats are likely to impact the service territory, emergency response planning is initiated to estimate outages, prepare personnel, and secure resources.

d. Training

UGI is undergoing a re-evaluation of its training programs. In addition, UGI is implementing a replacement Learning Management System (LMS) to track personnel qualifications to ensure employees are receiving the proper training for roles they are assigned.

e. Personnel Sufficient

UGI will have enough personnel to address any summer event. In addition, UGI trained personnel from its Gas Division to perform a wire guarding role to assist the electric utility during large storm restoration events. UGI is also working to expand the number of Gas Division personnel that have been trained for wire guarding and will expand the training to include storm damage assessment in the future.

f. Any other relevant continual improvement activity

UGI continues to improve its event preparedness through its Storm Group meetings and focusing drills on various aspects of storm restoration such as, pre-planning, on-boarding, communications etc. Adopting a modified incident command structure, to better align with UGI Electric Division personnel abilities, allows for better execution of its restoration plan. In addition, UGI continues to be an active member of the EDC Storm Best Practices Group and the North Atlantic Mutual Assistance Group.

g. New programs/new technology implementation

UGI has not implemented any new programs or technologies for summer readiness during the current reporting period.

VI. Storm Response

a. Outage Restoration Strategy

UGI's outage restoration strategy is like that of other electric utilities in the state. Its priority is to address public safety situations, such as live wires down, structure fires or other similar hazards. While addressing public safety situations, UGI concentrates transmission resources to restore power to its substations and then focuses on restoring service to feeders that serve critical infrastructure, such as water, sewer, and emergency services facilities. It then works on restoring its remaining distribution lines starting from the substations and working outward locally prioritizing the repair jobs based upon the number of customers that can be restored, the location of its resources, and the magnitude of the repair jobs so that it generally restores service to the most customers in the shortest period of time. Restoring service to critical needs customers is factored into its restoration process.

b. Communication and Outreach

Traditional Customer Communication Channels

UGI maintains traditional direct-to-customer communication channels. These include information provided via recorded, and continuously updated, Call Center messages on the Company's phone system; scripts prepared for use by Call Center representatives when interacting with customers; and messages prepared for use with the Company's 'predictive dialer' capability.

Additionally, UGI provides regular updates, information, and links to additional resources on key topics to customers via bill messages, bill inserts, printed notices and a monthly customer newsletter called "Connections" included with both printed and electronic bills.

UGI also conducts an extensive municipal outreach program aimed at reinforcing relationships with, and providing information to, elected and appointed municipal leaders, public safety professionals and emergency response officials. Outreach meetings with elected and appointed officials are conducted throughout the year. Topics include coordination of incident response efforts, safety, planned construction projects, and other matters of mutual concern.

Broadcast Media, Social Media, Digital Communication Channels and Tools

The UGI Communications and Community Relations Department and the UGI Customer Outreach Program use an integrated platform of channels to provide critical information to customers. Additional communications are provided to customers and community residents during extreme weather events, emergency situations and service outages. The communication channels and tools UGI utilizes include:

- Media communications, such as:
  - Public Service Announcements
  - Media advisories
  - News releases
  - On-air interviews and appearances
- UGI website postings, such as:
  - Banners on UGI.com homepage
  - Activation of an Outage Center 'tile' link on the UGI.com website
  - Live/updated information on Outage Center Map
- Social media information and update postings, such as:
  - Facebook
  - Twitter
  - UGI Connection (blog)
  - Linked-In
  - Instagram
- Outbound email to customers who provided their email address to the Company

All content provided to customers and interested parties is consistent across the print, broadcast, digital and social media channels. In addition, electronic links are provided on social media posts to take customers and interested individuals to copies of the original documents. UGI also maintains response protocols for inquiries from customers that are posted on social media sites. First, customers who may have an emergency are directed to contact UGI's Call Center. Customers who post service-related matters on one of the Company's social media sites are treated as 'escalated' inquiries, and the customer is asked to send a private communication (email or call) so that specific customer information can be collected and an appropriate response provided by Company representatives.

c. Outage Restoration and Storm Response Best Practices Implemented and/or Identified for Future Implementation

UGI uses a restore before repair approach, such that customers that can accept service are restored through switching and fuse replacement before engaging the field crews in repair work. This method of operation applies throughout the restoration effort such that as line segments become available to return to service after repairs are made, they are placed in service to restore service to customers on them.

UGI has adopted a practice where outage restoration strategy is determined by a combination of outage events and customers affected. UGI uses a centrally controlled operation during minor event restorations. Scouts, line clearance, and line construction crews are dispatched from the control center to verify device status, perform switching, assess OMS events, and begin restoration. For smaller events, this strategy maximizes personnel efficiency and provides a central command center to oversee restoration. For major events, UGI uses a decentralized mode of operation. Depending upon the extent of the damage to its system, UGI divides its service territory into areas and assigns an area coordinator to manage damage repairs in each area. Each area coordinator has complete responsibility to plan and manage the resources to restore service in his/her assigned area. UGI has found this strategy eliminates communications bottlenecks such that available resources are used most effectively.

d. Any other relevant continual improvement activity

UGI has implemented a new Reliability Working Group, which is an assembly of subject matter experts across all departments, that meet on a monthly basis to review outages and discuss/implement solutions that will improve reliability. In addition, a resource has been added to the electric division to support reliability initiatives, such as reliability tracking and reporting, system improvement planning, and identifying and resolving reliability problems.

e. New programs/new technology implementation

UGI has initiated plans to upgrade target devices and implement a FLISR (Fault Locating, Isolation and Service Restoration) system to sectionalize and restore circuits in certain situations. While the system is being prepared for a future fully automated design, an interim solution is being implemented that will notify system operators of restoration opportunities so manual switching can be performed.

VII. COVID-19

a. Impact on operations/capital projects in 2020

COVID 19 did not have a significant impact on operations or capital projects in 2020. Some close quarters work, such as underground cable replacement, distribution pole reinforcements, and substation equipment replacements, were delayed or had deadlines extended. These projects have since been completed or are scheduled to be completed in 2021. Operational impacts were mostly related to the System Operations Department and the need to separate the dispatchers to ensure limited potential for COVID-19 exposure as discussed below. Several programs such as our Company Owned Service Program were

temporarily suspended during the height of the pandemic due to ensure the safety of the public and contractors involved. These programs have since resumed.

A significant change in operations came with the addition of a second control center, which was added to physically distance system operators to ensure reliable and safe operation of the grid. Within this group, operators have been divided in two groups and work from these two separate locations (primary and backup) to cover the shifts. They do not have physical interaction and shift changeovers are handled via a barrier or remotely. Sanitizing is completed when operators start and end a shift and they also bring their own keyboard, mouse and phone headset.

b. Overview of 2021 operations and capital projects and COVID-19 protocols

UGI continues to follow COVID-19 protocols from local, state, and federal agencies to ensure all 2021 operational activities and capital projects can be completed safely. Company employees have access to all necessary PPE. UGI work procedures were developed to accommodate specific work-related tasks and environments. Specifically, UGI continues to stagger shifts, work remotely, enforce single person vehicle rules and dispatch/work from home where practical. The Company continues to monitor local, state, and federal recommendations with respect to ongoing COVID protocols and adjust accordingly.

c. Lessons learned and best practices captured for future operations

Having successfully operated through COVID-19, the experience gained has allowed the company to refine certain emergency management, business continuity, and pandemic response plans to help guide future actions. Some key best practices and lessons learned include:

- The company was able to operate efficiently while working remotely
- Identified a critical need for an adequate stock and source of supply for certain types of PPE and sanitizing equipment
- Certain atypical safeguards identified as needed were effective, such as automated temperature kiosks, mobile handwashing stations, and additional starting locations to limit exposure
- The need for specific close contact work protocols
- Refined the list of essential positions and improved procedures to ensure the continuity of business operations