Pennsylvania Summer Reliability

PENELEC

A. Reliability Enhancement Programs

Pennsylvania Electric Company ("Penelec" or "Company") is committed to providing safe and reliable electric service to its customers. Penelec employs various programs to maintain system reliability. For example, to reduce the likelihood of distribution line and equipment caused outages, Penelec follows inspection and maintenance ("I&M") programs that set forth schedules for regular inspection of its distribution facilities.[1] In addition to I&M, Penelec employs other routine programs to ensure the reliability of its distribution system. For example, Penelec may perform sectionalization of the system to reduce outages, evaluate devices that experience multiple interruptions, and perform enhanced tree trimming in conjunction with the normal cycle based tree trimming.

In addition to the items described above, Penelec has put into place additional plans, through various filings, to further support and improve reliability performance. These filings include a Corrective Action Plan ("CAP"),[2] Reliability Plan,[3] Worst Performing Circuit ("WPC") Plan,[4] and the Long Term Infrastructure Improvement Plan ("LTIIP").[5] Components of these plans, in combination with the Company's routine reliability programs, are described in the sections below.

Installing new cutouts is expected to greatly enhance the reliability of the 34.5kV system and reduce the number of equipment failures. Penelec's porcelain cutout replacement program is specifically geared towards the 34.5kV system. In 2015, Penelec replaced porcelain cutouts on sixty-seven circuits, and plans to complete an additional sixty-eight circuits by the end of 2016.

Targeted circuit rehabilitation is performed where the Company first conducts an inspection to identify equipment replacement needs and then schedules and completes the work. Equipment may include poles, switches, crossarms, insulators, braces, and cutouts. In 2015, Penelec completed the rehabilitation of four circuits, and plans to complete the rehabilitation of two additional circuits in 2016.

Supervisory control and data acquisition ("SCADA") provides communication with circuit breakers and line switches, which provides the ability to remotely operate the breakers or switches to reduce restoration time. SCADA eliminates the need for dispatched crews to manually operate the switch and has the potential to reduce the number of customers

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[1] Pursuant to 52 Pa. Code § 57.198, every two years an electric distribution company shall file, and receive approval from the Commission of, a biennial plan for the periodic inspection, maintenance, repair and replacement of its facilities. On December 30, 2013, Paul Diskin, Director, Technical Utility Services, issued a letter approving the Company's biennial inspection, maintenance, repair, and replacement plan effective January 1, 2015 through December 31, 2016.

[2] In December 2014, Penelec submitted a CAP designed to improve overall reliability and achieve benchmark performance in all three indices by year-end 2018.

[3] On March 30, 2015, the Commission issued an order directing, Pennsylvania Electric Company to prepare and file a revised implementation plan relating to specific topics addressed in the report issued by the Commission's Bureau of Audits on February 12, 2015. *Implementation Plan for the Focused Management Audit of Pennsylvania Electric Company,* Docket No D-2013-2365992,

[4] See Footnote 3.

[5] On October 19, 2015, pursuant to Section 1352 of the Pennsylvania Public Utility Code, 52 Pa. Code §§ 121.1 et seq. and the Commission's final order in Implementation of Act 11 of 2012, Pennsylvania Electric Company filed their petition for approval of their LTIIP at Docket No. P-2015-2508936. On February 11, 2016 the Commission approved the plan.

affected by an outage, as well as the outage duration. Fourteen SCADA controlled switches were installed in 2015, and the Company plans to install an additional thirteen in 2016.

As part of its vegetation management program, Penelec thoroughly inspects and performs vegetation management on every circuit once every five years. The vegetation management program includes removal of off right-of-way priority trees that are dead, dying, diseased, and leaning, or those that are significantly encroaching upon the right-of-way. Penelec also invests in the proactive removal of Ash trees that have been deemed a threat due to the Emerald Ash Borer insect. Penelec accelerated the removal of trees outside the right-of-way on its distribution and 34.5kV system. In 2015, Penelec accelerated the removal of trees outside of the right-of-way on over 1,100 miles and plans to accelerate the process on approximately 400 miles in 2016.

Penelec is also conducting mid-cycle danger tree removal on the top seven circuits with high tree outages. In addition, post storm patrols are performed to identify vegetation that could potentially pose an outage risk.

B. Preventative Maintenance Programs

In accordance with 52 Pa. Code § 57.198, every two years, Penelec files a Biennial Inspection, Maintenance, Repair and Replacement Plan (as described in Footnote 1) for approval by the Commission. This Biennial Plan is designed to reduce the risk of outages on the Company's system and form the basis for the Company's inspection and maintenance objectives. The Biennial Plan includes programs to conduct vegetation management, pole inspections, distribution overhead line inspections, distribution transformer inspections, recloser inspections and substation inspections.

These well-established maintenance programs ensure the existing system will continue to operate in a safe and reliable manner, and serve to identify any potential system issues so that they can be proactively addressed.

C. Capacity Planning

As a result of ongoing system enhancements and the hard work of employees and contractors, Penelec is able to reliably serve its customers. The primary driver of customer demand this summer is again expected to be weather related.

Penelec does not foresee significant concerns with system delivery capacity during the upcoming summer based on its performance during last summer's peak. Ongoing facility enhancements designed to improve reliability, load-bearing upgrades, and customers' adoption of energy efficiency and conservation opportunities are being viewed as additional opportunities to ensure the reliability and capacity availability of the system.

D. 2015/2016 Storm Update and Lessons Learned

In calendar year 2015, Penelec did not experience any major events.

Throughout restoration efforts, working safely and efficiently is the main objective. Regional conference calls are executed to plan and prepare logistics. Effective planning allows for the precise deployment of crews, supplies, and equipment. Employees are also staggered around the clock to maximize productivity.

After each significant storm event, Penelec leadership conducts post storm review meetings to identify and disseminate lessons learned which are used to improve the emergency response plan.

E. 2016 Summer Readiness

Capacitor Inspections – As of June 1, 2016, Penelec will have inspected all line capacitor banks and completed all necessary repairs or replacements to ensure at least 98% availability.

Mobile Substations – As of June 1, 2016, completed a review of the status of its mobile substations and other spare equipment. This included inspections of the mobile trailer, transformer and breaker. Spare equipment includes voltage regulators and substation cooling items such as transformer fans.

Substation – As of June 1, 2016 Penelec will have inspected all substation capacitor banks and completed necessary repairs or replacements to ensure minimum 98% available reactive support.

Capacity Additions – Penelec has determined that no additional projects are required to meet the summer demand for 2016.

Transmission Preparedness – Penelec conducts an annual transmission readiness review with transmission operations to discuss the capability and reliability of the system for the summer. The Company's detailed review did not reveal any significant issues for the summer of 2016. Based on the system conditions modeled, the Penelec transmission system is expected to sufficiently support the forecasted peak summer loading. During the system assessment, a review of the voltage stability analysis was conducted and produced acceptable Power-Voltage response curves.

Two aerial patrols are conducted annually in Penelec to inspect transmission facilities. The purpose of routine patrols is to ensure the integrity of in-service transmission lines to maintain safe and reliable service. The first aerial patrol was completed in April 2016 and the second will be completed by year end.

Additionally, PJM Interconnection LLC ("PJM") has operational procedures identified to effectively control and mitigate contingency outage conditions on the transmission system. Penelec has operational procedures to implement any PJM required actions and to mitigate contingency conditions on the lower voltage systems (<100kV).

Emergency Exercises – As part of the FirstEnergy Utilities ("FEU") Emergency Preparedness program, Penelec completed a Company-wide emergency exercise on March 31, 2016. The structure of the exercise facilitated the testing and validation of key emergency response roles, systems and processes. The primary objective of each exercise was to ensure a complete understanding of the restoration process by all participants through exposure to a variety of real-world scenarios and decision making challenges that could be experienced during actual restoration events.

Event Preparedness – FirstEnergy's in-house meteorologists use highly sophisticated, proprietary data and forecasting models specifically designed to provide actionable intelligence. When predicted weather meets specific criteria, planning and preparation work is immediately initiated, many times days before any impact.

As part of the preparation efforts, Penelec's executive leadership and operations managers engage the emergency restoration process. Based on available data and collaboration within Penelec, resource needs are evaluated and requests are submitted as needed to the FEU Emergency Operations Center for fulfillment. These requests can include, but are not limited to: line resources (both internal to FirstEnergy and external), hazard responders, damage assessors, public protectors, vegetation crews, equipment needs, and material requirements. Depending on the predicted magnitude of the event, staging areas are pre-identified and can be quickly activated to prepare for the efficient deployment of crews and equipment.

Refresher Training – All employees with emergency response roles receive appropriate refresher training at specified intervals in order to be immediately deployable when an event impacts the system. Expectations for employees to complete appropriate training and verify all equipment and personal protective equipment are available and in proper working order are communicated each year during emergency exercises and verified by Penelec management.

Staffing – For the summer of 2016, Penelec is fully staffed for the storm season. In addition, Penelec conducts a staffing analysis annually which accounts for attrition, including retirements, to determine the proper staffing levels of craft workers. From the result of this analysis, Penelec enrolls students the Power Systems Institute ("PSI"), which is a unique, two-year program that combines classroom learning with hands-on training, will be reinstated beginning with fall enrollment 2015. The following colleges have partnered with Penelec to support these line worker and substation electrician development:

- Porreco College of Edinboro University for Line students.
- Pennsylvania Highlands Community College for Line and Substation students.

For larger-scale events, Penelec is able to supplement its own resources by accessing FirstEnergy's portfolio of operating companies that includes the additional three companies located within Pennsylvania, as well as an additional six operating companies in other jurisdictions. The consistency in standards and work practices employed across all ten of these operating companies enables streamlined resource sharing in a way that promotes both safety and efficiency.

FirstEnergy, for itself and its affiliated operating companies, including Penelec, is a member of the following Regional Mutual Assistance Groups ("RMAGs") and can call upon them to request additional resources when needed:

- Great Lakes Mutual Assistance Group ("GLMA")
- North Atlantic Mutual Assistance Group ("NAMAG")
- Southeastern Electrical Exchange ("SEE")

A National Response Event ("NRE") can be activated by EEI member utilities when multiple RMAGs cannot adequately support the resource requirements of the requesting utilities.

F. Storm Response

Outage Restoration Strategy – Penelec begins preparing for potential outages long before severe weather hits. When severe weather is forecasted, Penelec plans are activated days before to ensure an adequate number of crews are prepared to tackle the damage. Part of this preparation includes running a model that estimates the impact of an impending weather threat and outputs information such as the expected number of customers impacted. This output, along with historical storm experience, is used to estimate the impact of the weather event so that properly scaled preparations can be made.

Information obtained through the use of various tools and resources is critical to determine the type, number and location of resources needed to assure prompt restoration of service. Line personnel, damage assessors and hazard responders are integral resources in providing initial and ongoing assessments of the damage in the field. Line personnel are equipped with mobile data terminals ("MDTs") in their vehicles and will input damage information directly into the MDT. This information is immediately available for viewing in the Outage Management System ("OMS"). The OMS is the central collection point for all relevant information concerning damage reports, assessment and configuration of the electric distribution system. During emergencies that meet triggering criteria, the circuit quarantine process is used for rapid assessment of heavily damaged circuits. Additionally, there are two apps that employees can use on mobile devices to automatically enter damage information into the company's OMS. In the past, this process relied on paper maps, hand written notes and phone calls between field responders and dispatch offices.

In response to power outages and other systems emergencies, FirstEnergy maintains a copy of its Emergency Plan for Service Restoration ("E-Plan") which provides the guidelines for all of the common processes and procedures for conducting emergency preparedness, response and service restoration. Further, Penelec is in the process of incorporating the Incident Command System ("ICS") principles in its emergency response organization to adhere to the principles and high level structure to the National Incident Management System ("NIMS") as appropriate in an electric utility environment.

Communications and Outreach – External Affairs managers establish communications with emergency management agencies, local officials, county commissioners, and legislators and their offices in advance of and throughout a storm to keep them apprised of preparation and planning efforts. Communications representatives also contact the media to enlist their help in encouraging customers to prepare for the likely storm events and

provide information on who to call if they lose power. Proactive email alerts and phone messages are initiated to key stakeholders alerting them to the potential for extended power outages. These efforts and face-to-face outreach are closely aligned with the Company's service restoration efforts. The Company also provides safety messages via newspapers, radio, and online banner ads.

Penelec uses social media, mobile applications, websites and IVR messaging to communicate outage and restoration information customers Twitter and Facebook are used to communicate outage and restoration information to customers. During the restoration period, Penelec uses social media to share additional safety reminders; estimated time of restoration; updates on restoration efforts, including work progress, explanations of the restoration process and information about the arrival of additional crews; water and ice locations, and links to other resources such as shelters.

The Company's mobile website and mobile app offers customers the ability to report outages and connect to an outage map that is optimized for mobile devices. From the mobile site, customers can view personalized outage status for an outage they have reported to Penelec. The mobile website and app, as well as the full Penelec website, also allow customers to register for outbound billing, payment and outage-related alerts via text messages and/or email, and these platforms also provide instructions to use two-way text messaging, an interactive option for customers to report outages and obtain outage updates.

Customers can access the Storm Restoration Process page of the website, for a description of the damage assessment process, information describing why customer calls and outage reporting are critical to the restoration process, as well as repair prioritization process. Customers can access the 24/7 Power Center outage map that provides county-by-county information. Through this site users can obtain the number of customers served and the number of customers out of power at the county level as well as estimated time of restoration information.

Customers are now able to view the status of crews restoring service on the Company's 24/7 Power Center outage map. This informs customers when crews have been dispatched, when they are working on a repair, and when additional crews or equipment are needed to complete restoration work.

Three stages of messaging are provided to customers during large scale events via its IVR messaging:

- Pre-ETR messaging during, and immediately following the event; and ETR messaging.
- The messaging is also relayed to customers who call regarding their individual outage and is also posted online on the 24/7 Power Center outage maps.
- In addition, Live Agent Customer Service Representatives have the same information at their disposal to clearly communicate to customers at these three stages.

For extended power outages, Communications issues regular news releases and media advisories over both traditional media channels and social media to update customers on

the status of power restoration efforts, as well as provide realistic ETRs so customers can plan accordingly. Communications proactively issues safety messaging ranging from avoiding downed wires to properly hooking up and operating generators. The Company also has plans in place to provide free water and ice to customers without service. Once locations have been determined this information is communicated to customers via the IVR, press releases, social media and the website.

Outage Restoration and Storm Response Best Practices – Penelec continues to review each and every storm event, and many of the practices adopted as mentioned above stemmed from sharing best practices with other utilities, a practice that continues today.