

# Pennsylvania Summer Reliability

## PENN POWER

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### A. Reliability Enhancement Programs

Pennsylvania Power Company (“Penn Power” or “Company”) remains committed to providing safe and reliable electric service to its customers and employs various programs to strengthen the durability and flexibility of the electric system. The Company has put into place plans, which are described in various filings, to further support reliability performance. These plans include a Corrective Action Plan (“CAP”),<sup>1</sup> Reliability Plan,<sup>2</sup> and the Long-Term Infrastructure Improvement Plan (“LTIP”).<sup>3</sup> Components of these plans are described below.

Along with the vegetation management work that Penn Power routinely performs, the Company performs additional tree trimming to remove numerous trees (healthy or not) located outside of the right-of-way. Trees in this area impact lines and make it more difficult to restore power quickly. In 2016, Penn Power performed additional trimming on 400 miles of circuits. The Company plans to continue with this aggressive off right-of-way tree removal program by performing additional trimming on 685 miles in 2017.

Supervisory control and data acquisition (“SCADA”) provides communication with circuit breakers and line switches enabling workers to remotely operate the breakers or switches to reduce restoration time. SCADA eliminates the need for dispatched crews to manually operate the switch and can potentially reduce the number of customers affected by an outage, as well as the outage duration. In 2016, Penn Power installed thirty SCADA line switches on its transmission system and five SCADA line switches on its distribution system. In 2017 Penn Power plans to install an additional fourteen switches on the distribution system.

The Company uses distribution circuit ties and loops which create an alternate path for power provided to customers affected by an outage. In 2016, Penn Power created thirteen circuit ties and loops between radial circuits and has plans to create an additional ten circuit ties, loops or new sources by the end of 2017.

Penn Power continues the rehabilitation of selected transmission lines. Poles, switches, crossarms, insulators and braces are typically replaced as part of the program. In 2016, Penn Power completed twenty-four miles of 69kV line rehabilitation. In 2017, Penn Power will inspect approximately twenty-four miles of transmission lines, replacing equipment as necessary. This project will strengthen Penn Power's 69kV system, thereby decreasing the risk of extended outages affecting a high volume of customers.

The Company's Underground Residential Distribution (“URD”) Cable Replacement program helps reduce the number of outages by targeting the replacement of bare concentric

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<sup>1</sup> In November 2014, Penn Power submitted a CAP designed to improve overall reliability and achieve benchmark performance in all three indices by year-end 2018. The projects and initiatives included in the CAP were for the period of 2014-2018.

<sup>2</sup> On March 30, 2015, the Commission issued an order directing, Pennsylvania Power 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 Power Company*, Docket No D-2013-2365993,

<sup>3</sup> 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 Power Company filed their petition for approval of their LTIP at Docket No. P-2015-2508948. On February 11, 2016 the Commission approved the plan.

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neutral cable, which was manufactured without an insulating jacket around the concentric neutral wires. This design often caused the cable to fail prematurely. Penn Power plans to replace approximately 25,000 feet of cable in 2017.

To improve the infrastructure, Penn Power targets the replacement of wood poles that have degraded beyond restorable condition and the reinforcement of poles that are restorable. In 2016, the Company replaced or reinforced 351 wood poles and plans to replace or reinforce approximately 480 wood poles in 2017.

### B. Preventative Maintenance Programs

In accordance with 52 Pa. Code § 57.198, every two years Penn Power files a Biennial Inspection, Maintenance, Repair and Replacement Plan<sup>4</sup> 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 they can be proactively addressed.

### C. Capacity Planning

Due to ongoing system enhancements and the hard work of employees and contractors, Penn Power is able to reliably serve its customers. The primary driver of customer demand this summer is again expected to be warm temperatures across the region.

Penn Power 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. 2016/2017 Storm Update and Lessons Learned

In calendar year 2016, Penn Power did not experience any major events.

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<sup>4</sup> 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 Companies' biennial inspection, maintenance, repair, and replacement plan effective January 1, 2015 through December 31, 2016. Further, on March 4, 2016 an additional letter was issued approving the plans effective January 1, 2017 – December 31, 2018.

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Throughout restoration efforts, working safely and efficiently is the main objective. Regional conference calls are held for preparation and logistics planning. 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, Penn Power leadership conducts post-storm review meetings to identify and disseminate lessons learned which are used to improve the emergency response plan.

### E. 2017 Summer Readiness

**Capacitor Inspections** – By June 1, 2017, Penn Power will have inspected all line capacitor banks and completed all necessary repairs or replacements to ensure at least 98% availability.

**Mobile Substations** – By June 1, 2017, Penn Power will have completed a review of the status of its mobile substations. Included in the inspections are the mobile trailer, transformer and breaker

**Substation** – By June 1, 2017, Penn Power will have inspected all substation capacitor banks and completed necessary repairs or replacements to ensure minimum 98% available reactive support. In addition, a review of spare equipment will have been completed. Spare equipment includes voltage regulators and substation cooling items such as transformer fans.

**Capacity Additions** – Penn Power has determined that no additional projects are required to meet the summer demand for 2017.

**Transmission Preparedness** – Penn Power 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 2017. Based on the system conditions modeled, the Penn Power 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 Penn Power 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 has been completed 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. Penn Power has operational procedures to implement any PJM required actions and to mitigate contingency conditions on the lower voltage systems (<100kV).

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**Emergency Exercises** – As part of the FirstEnergy Utilities (“FEU”) Emergency Preparedness program, Penn Power plans to complete a Company-wide emergency exercise on September 6, 2017. The exercise facilitates the testing and validation of key emergency response roles, systems and processes. The primary objective of each exercise is 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, Penn Power’s executive leadership and operations managers engage the emergency restoration process. Based on available data and collaboration within Penn Power, 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 to ensure they are 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 Penn Power management.

**Staffing** – Penn Power is fully staffed for the 2017 summer storm season. Penn Power performs an annual staffing analysis that accounts for attrition, including retirements, to determine the proper staffing levels of craft workers. Penn Power then enrolls students in the Power Systems Institute (“PSI”) based on the results of the analysis. PSI is a unique, two-year program that combines classroom learning with hands-on training. Penn Power is expected to hire eight line worker graduates and four substation electrician graduates in 2017.<sup>5</sup> The objective of the PSI program is to proactively hire a diverse group of individuals that will fulfill the line work and substation electrician staffing needs for Penn Power. The following colleges have partnered with Penn Power to support these line worker and substation electrician development:

- Kent State University (Ohio)
- Stark State College (Ohio)

For larger scale events, Penn Power is able to supplement its own resources by accessing FirstEnergy’s portfolio of operating companies that includes the additional three companies

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<sup>5</sup> Numbers are subject to change.

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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 Penn Power, 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** – Penn Power begins preparing for potential outages long before severe weather hits. When inclement weather is forecasted, plans are activated 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 calculates 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 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 enter 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. This is an improvement over the past process which relied on paper maps, handwritten 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 common processes and procedures for conducting emergency preparedness, response and service restoration. Further, Penn Power is in the process of incorporating Incident Command System (“ICS”) principles into its emergency response

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organization to adhere to the principles and high level structure of 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 of 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 provides safety messages via newspapers, radio, and online banner ads.

Penn Power customers can stay abreast of restoration progress through a variety of means. A customer can access the Storm Restoration Process page of the Company’s website to learn about the damage assessment and repair prioritization processes as well as the importance of customer calls and outage reporting during the restoration 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 (“ETR”) information. In addition, the 24/7 Power Center outage map shows the status of crews restoring service, and 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.

Penn Power’s mobile website and mobile app allow customers to report outages and connect to the 24/7 Power Center outage map which has been optimized for mobile devices. From the mobile site, customers can view personalized outage status for an outage they have reported. The mobile website and app, as well as the full Penn Power website, also allow customers to register for outage-related alerts via text messages and/or email. These platforms also provide instructions to use two-way text messaging, an interactive option for customers to report outages and obtain outage updates.

Furthermore, Penn Power uses Twitter and Facebook to share additional safety reminders, ETRs, updates on restoration efforts, 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.

In addition, Interactive Voice Response (“IVR”) messaging is used to communicate restoration information to customers. Messaging is also relayed to customers who have called Penn Power regarding their individual outage. Live Agent Customer Service Representatives are available and have the same information at their disposal.

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

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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** – Penn Power continues to review each storm event, and many of the practices adopted as mentioned above stemmed from sharing best practices with other utilities, a practice that continues today.