

# Pennsylvania Summer Reliability

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### A. Reliability Enhancement Programs

In 2013, Penelec continued its reliability strategy which consisted of completing a circuit protection program that was initiated in 2008. This program sought to improve reliability by completing coordination studies on its poorest performing circuits from a SAIDI perspective and installing additional sectionalizing devices to minimize customer outages. These additional reclosers, sectionalizers, and fuses improve reliability but especially help to “storm proof” the system. Penelec engineering will continue this practice in 2014, examining an additional 89 poor performing circuits.

Penelec also continues to install additional radio controlled remote sectionalizing equipment on its distribution system to enhance operations. Distribution substations are evaluated by outage data and customers served to determine the best candidates for remote sectionalizing installations. Eleven (11) additional locations on the Penelec system have been identified in 2014 to engineer and construct remote switching capabilities.

### B. Preventative Maintenance Programs

Well-established maintenance programs, such as the Vegetation Management Program, ensure the existing system will continue to operate in a safe and reliable manner. Penelec also employs maintenance programs aimed to specifically address worst performing circuits and identified line segments where reliability issues may exist.

**Capacitor Inspections** – Penelec is on track to complete inspections by June 1 on all line capacitor banks and completed all necessary repairs or replacements to ensure at least 98% availability.

**Substation** - Substation based capacitor banks at the transmission and distribution level were inspected for operability. Any necessary repairs or corrective maintenance will be completed before June 1 to ensure a minimum of 98% available reactive support. Oil coolers that are mounted on large power transformers were cleared of debris and washed to ensure peak performance during periods of high loading. Planned equipment outages are held to a minimum in the summer months during times of high temperature and load to maintain system integrity.

**Aerial Patrols** - Two aerial patrols are conducted annually in Pennsylvania 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 of transmission lines in Penelec was completed in April and the second will be completed by year end.

### C. Capacity Planning

Penelec’s power distribution system annually experiences peak usage periods based on the demand requirements of our customers. The summer peak typically has a negative effect on system operations. This is predominately due to an increase in ambient air

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temperature which adversely contributes additional strain to the system and transformers. In recent years, the summer heat has created a larger electrical demand than normally experienced. Consequently, with these additional stresses on the system, weak and heavily loaded areas have been identified. This has led to a comprehensive evaluation of substation transformers, system upgrades at multiple sites and system voltage correction projects.

The weather is again expected to be the primary driver of customer usage this summer. Penelec does not foresee significant concerns in system performance during the upcoming summer based on last years' system operation during various heat waves. Ongoing facility enhancements designed to increase reliability, load-bearing upgrades, and customers' adoption of energy conservation and efficiency opportunities are being viewed as additional opportunities to strengthen the system.

The energy efficiency and conservation programs offered to customers as part of Penelec's compliance with Pennsylvania Act 129 are also reducing overall demand. Residential Programs include Appliance Turn-In, Energy Efficient Products, Energy Efficient HVAC Equipment, Residential New Construction, Home Performance, and Limited Income Energy Efficiency. Non-Residential Programs include Commercial and Industrial ("C&I") Equipment – both Prescriptive and Custom.

Penelec also has a system review process in place whereby substation and circuit feeders are monitored to ensure accurate capacity planning. Results are reviewed to determine potential projects necessary to correct any capacity or voltage issues. Using the results of this review, Penelec can make upgrades to the system by way of capacitors, regulators, transformer tap changes, transformer upgrades, etc. as needed on a case by case basis. Penelec is confident its 2014 plans will continue to have a positive impact on reliability. Penelec's electric delivery system is able to serve customers' needs without problems as a result of the ongoing system enhancements and the hard work of employees and contractors.

### **D. 2012/2014 Storm Update and Lessons Learned**

In calendar year 2012, Penelec experienced two major events. During any weather event, safety remains the number one priority.

Throughout coordination 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 major storm event, Penelec leadership conducts post storm review meetings to identify and disseminate lessons learned to be used for improving the emergency response plan.

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### E. 2014 Summer Readiness

#### Capacity Additions:

- **Install a 250 MVAR Static VAR Compensator (SVR) on 230kV at Altoona Substation:** This project mitigates post contingency voltage concerns on the 230kV bulk electric system.
- **Replace Blairsville 138/115kV Transformer with a 135/180/225 MVA unit:** Replacing this transformer resolves voltage concerns on the 138kV bulk electric system.
- **Install 2-500kV Breakers and Three Single Phase 500-230kV Transformers (600MVA) at Conemaugh Substation:** This project reduces congestion on the Altoona-Bear Rocks 230kV line.
- **Construct 2.4 Miles of New 230kV Line from Connemaugh Substation to Seward Substation:** This project reduces congestion on the Altoona-Bear Rocks 230kV line.

**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 2014. Based on the system conditions modeled, Penelec's transmission system is expected to sufficiently support the forecasted peak summer loading.

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

**Event Preparedness** - Planning and preparation work is initiated days before a storm strikes. As part of those efforts Penelec's in-house meteorologists closely monitor weather data and track storms to assess the potential impact on the electrical system and service area.

If it is determined that a storm could potentially disrupt service, Company leadership and operations managers hold conference calls and conduct meetings to evaluate the need for forestry, hazard responders, damage assessors and line crews as well as supplies and equipment. This core management team also evaluates the need for additional crews from other affiliated operating companies, as well as outside utilities and contractors. Depending on the magnitude of the storm, staging areas are organized to prepare for the efficient deployment of crews and equipment.

Additionally, in preparation for the summer storm season, Penelec completed a company-wide storm drill on May 15. The purpose of this drill was to test participants' understanding of the storm process by exposing them to a variety of real-world problems and decision making challenges that could be experienced in real storm events.

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**Refresher Training** – All employees with storm response roles (hazard responder, hazard dispatcher, storm analyst, etc.) have received appropriate refresher training in preparation for the summer storm season.

### F. Storm Response

**Outage Restoration Strategy** - In the early stages of service restoration, hazard responders go into the field to locate damage to the electric system and identify electric hazards – such as downed and potentially energized wires – and then remain at those locations to protect the public until linemen safely isolate or clear the hazard. Next, forestry crews clear fallen trees and branches as well as other debris so utility workers can repair and re-energize power lines.

Once debris has been cleared from the affected areas, service is initially restored to high-voltage transmission equipment, lines and substations, because they supply power for local distribution systems. After that, crews focus on restoring service on a high-priority basis to hospitals, critical care, life-support facilities, and critical first responders' facilities. Focus is then placed on repairs that will bring the greatest number of customers back in service. Next, repairs that restore service to individual customers occur.

**Communications and Outreach** - External Affairs managers establish communications with emergency management agencies (“EMAs”), local officials and regulators 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. These efforts and face-to-face outreach are closely aligned with our service restoration efforts. The Company also provides safety messages via newspapers, radio, and as online banner ads. Proactive email alerts and phone messages are initiated to key stakeholders, critical care, and well water customer alerting them to the potential for extended power outages.

**Enhanced Communication Efforts** - Penelec is making it easier for customers to check the progress of service restoration efforts when they experience a power outage.

The Company's “24/7 Power Center” outage maps now display the status of crews restoring service after a power outage in the Penelec service territory. With this recent enhancement, Penelec customers can see when crews have been dispatched, when they are working on a repair, and when additional crews or equipment are needed to complete restoration work.

Penelec's mobile-optimized website and app provide customers with streamlined access to important information and services. In addition, customers can subscribe to email and text message alert notifications to receive billing reminders, weather alerts in advance of major storms, and updates on scheduled or extended power outages.

As it relates to estimated time of restoration (“ETRs”), Penelec is continuing to focus on finding ways to provide increasingly accurate information to the community based on the

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amount of storm damage. As part of these continuous improvements, customer specific ETR information is now available through IVR, eliminating the need to talk to a live agent.

**Restoration Material Staging and Delivery Efficiency Best Practices** - For major events, Corporate Materials Management will establish a Distribution Center Command Center ("DC CC") at the central warehouse supporting Penelec. The DC CC covers all functions related to supplying materials including demand planning, procurement, warehousing, transportation, and staging site support. The DC CC participates on all Penelec and Corporate storm calls to stay abreast of restoration progress and crew movements. Prior to an event, if extensive damage is anticipated, the DC CC team will pre-pick material for staging sites and also place orders for material with suppliers.

In addition, Penelec is a participant in the Mutual Emergency Materials Support ("MEMS") group. This group of approximately 45 electric utilities throughout the United States has pledged to assist one another to the extent possible during an emergency with material. MEMS participants assist in locating material from commercial sources or from within the participant's utility organization.

**Mutual Aid Crew Assignment Best Practices** – Resources may be provided to Penelec by other FirstEnergy affiliate companies, non-FE utilities through the various mutual assistance organizations, cooperatives, contractors or all of these if the event warrants this level of support. A request for assistance in Penelec's territory is made by the Director of Operations Services to the Corporate Mutual Assistance Coordinator who will coordinate all mutual assistance requests. The Corporate Mutual Assistance Coordinator maintains a situational awareness at all times in order to know what areas have either been affected or are likely to be affected by a weather event in order to obtain the appropriate number of crews for an area in a timely fashion.