



Duquesne Light Company
2022/2023 Storm Response
and
2023 Summer Readiness

May 30, 2023

Duquesne Light Company (Duquesne Light, DLC, or Company) provides safe and reliable electric service to approximately 610,000 customers throughout parts of Allegheny and Beaver Counties in southwestern Pennsylvania, including the City of Pittsburgh.

Duquesne Light customers experience strong electric service reliability; however, occasional severe weather and other emergency events occur, and service interruptions are unavoidable. When those interruptions occur, Duquesne Light relies on its comprehensive service restoration program to restore service safely and timely. Some of the more significant preparedness initiatives to ensure this high level of service reliability are detailed below.

i. Reliability Enhancement Programs

a. Enhanced Vegetation Management

Duquesne Light's Vegetation Management Department is executing its Vegetation Management Maintenance Program with the goal of reducing tree and branch failures through proactive tree pruning, and tree removal to increase clearance distances for identified portions of Duquesne Light's distribution facilities.

- i. DLC has preemptively focused on Ash tree removal since the identification of the Emerald Ash Borer in 2009. Ash trees comprise less than 1% of tree removals associated with the 2023 inspection and maintenance (I&M) workplan.
- ii. Beginning in 2021, DLC implemented a mid-cycle off-right-of-way (ROW) tree removal program to target conflict trees prior to tree failures. This program focuses on off-ROW tree removals on circuits between vegetation management cycles with the most frequent device interruptions.

b. Storm Hardening

Duquesne Light's primary storm hardening activity is its focus on identifying and addressing danger trees. Duquesne Light believes that the ROW Vegetation Management Maintenance Program will help to reduce the frequency of outages by addressing targeted tree failure conditions that have potential to result in physical damage to the Company's distribution facilities during storms.

c. Fuses/Reclosers/Automatic Switches

Duquesne Light's 23kV distribution circuits utilize 1,185 automatic three-phase sectionalizers and reclosers that divide each circuit into distinct load blocks of approximately 250-600 customers each. An additional nine intellirupters and 59 tripsavers were added in 2022-2023, beyond replacements. These devices

automatically isolate a downstream fault on the main feeder without causing outages to upstream customers. This action minimizes the number of customers that are affected by each outage. In addition, open tie devices are utilized between circuit load blocks that provide an alternate feed to the customers in each load block, which can maintain power in parts of the system while repairs are made on different sections.

Circuit laterals fed from the main feeder are generally protected by single-phase fuses that coordinate with the three-phase feeder devices to protect the main feeder and limit outages to a very small number of customers.

Duquesne Light utilizes pulse-reclosing fault protection and coordination with Intellirupter Reclosers and Scadamate Sectionalizers. This reduces the damage that can occur on a circuit during a fault sequence compared to traditional fault reclosing and makes circuit repair and restoration faster.

d. Smart Grid

Sectionalizers and reclosers used on Duquesne Light's 23kV distribution system are continuously monitored over a wireless network to its centralized Distribution Operations Center (DOC). Circuit problems are immediately annunciated at the DOC, where operators quickly take action to relieve overloads or isolate faults and reroute power to customers on non-faulted load blocks. When an outage occurs, DOC operators are usually able to isolate the actual fault from the rest of the circuit and restore all downstream customers within five minutes. This automation and remote monitoring also helps operators pinpoint the actual faulted load block so field crews can be directed to the failure location more quickly in order to begin repairs.

e. Conservation Voltage Reduction (CVR) Activity

Duquesne Light is not currently participating in Conservation Voltage Reduction (CVR) activities.

The standard configurations of the Company's automated 23kV and 4kV capacitors provide many of the advantages of CVR with their localized controls. Duquesne Light configures intelligent capacitor controls to switch capacitors on or off depending on localized voltage levels. The use of voltage-only configurations normally results in providing maximum Var support without exceeding voltage standards. This maximum Var support often supplies excess Var flow back towards the station allowing the tap-changing transformers at the station to regulate to a lower step since the transformer, and eventually the transmission system, are not burdened with the need to provide additional Var support to the distribution circuits.

f. Any other relevant continual improvement activity

DLC initiatives for continual reliability enhancement include the following:

- i. MAXIMO
 1. Integration of MAXIMO Work Management System has provided higher precision tracking and reporting of asset and financial information. The platform enhances the Company's ability to collect and track more granular location and equipment failure data.
- ii. Aerial cable rehabilitations projects planned for completion in next six months:
 1. Legionville-Conway 22866
 2. Wilmerding 23764
- iii. Unit Substation Conversions and 4kV MITS (Modular Integrated Transportable Substation) Installations planned for completion in next six months:
 1. Ardmore
- iv. Overhead/Underground Conductor Replacement planned for completion in next six months:
 1. Tower 2056-2057
 - a. Wilmerding D23760
 - b. Wilmerding-Rankin No. 1 22154
 - c. Wilmerding-Foundry No. 2 22164
 - d. Wilmerding-East McKeesport 22163
 2. Chess D23688
 3. Pine Creek D23711
 4. Wilson D23860
 5. Dravosburg-Bryn Mawr No. 1 22013
 6. Unionville 4809
- v. Substation Equipment Upgrades (Breakers, Switches, Control)
 1. Ten 23kV breakers and associated equipment replaced since 05/01/2022
 2. Four 23kV breakers and associated equipment to be replaced by 12/31/2023
- vi. Network Transformer Replacements
 1. Five Underground Network Transformer Replacements to be completed by 12/31/2023
- vii. Underground Residential Rehabilitation (URD)

1. Three URD Rehabilitations to be completed by 12/31/2023

viii. Green Tag Program

1. Stocked items that are purchased and managed by the Supply Chain Department that are kept in reserve for emergency replacement in the event of equipment failures. These items should not be used for general construction.

g. New Programs/New Technology Implementation

In late spring 2018, Distribution Planning began utilizing a software package called CYME v8.1 CYMDIST (CYMDIST). With CYMDIST, DLC planning engineers are able to perform several types of analysis on balanced or unbalanced three-phase, two-phase, and single-phase systems that are operated in radial, looped, or meshed configurations. Specifically, from a reliability standpoint, it has been used to correct phase imbalance, better coordinate fusing, identify overloaded equipment, and alleviate voltage concerns across the DLC 4 kV and 23 kV distribution systems.

Installation of new capacitor control boxes allows for additional information to be remotely monitored and additional setpoints to be used to better increase effectiveness.

Single-phase reclosers (TripSavers) were installed on several of Duquesne Light's worst performing 23 kV circuits as a pilot program to protect the main feeder and prevent sustained outages to customers on longer laterals.

Finally, Duquesne Light has updated all remotely monitored devices from a 3G network to a 4G network. This has increased the communication reliability to our remotely monitored devices.

ii. Preventative Maintenance Programs

a. Capacitor Inspections

All line capacitors are inspected both visually and with the use of infrared technology as part of overhead line inspections every five years.

b. Vegetation Management

Duquesne Light professionally manages a comprehensive vegetation management program utilizing industry best management practices to provide safe and reliable distribution service. This program is specifically designed for the management of vegetation on Duquesne Light's ROW for the dependable operation of its distribution (4kV, 23kV, and 23TkV) and transmission (69kV, 138kV, and 345kV) system and includes:

- i. Select tree pruning and removal within the ROW accomplished through ground based as well as aerial means;
- ii. Hazard tree assessment and the removal of defective, dead, diseased, or otherwise potentially hazardous trees within or along the ROW;
- iii. The selective mechanical and/or chemical control of incompatible tall-growing brush within the ROW; and
- iv. Specific methods for line clearance are chosen based on the type of work involved while achieving it in a safe, professional, economical, and environmentally sound manner.

c. Substation Inspections

Duquesne Light inspects each distribution substation once per calendar month. The purpose of the substation inspection is to identify any emerging issues within the substation so that they can be corrected in a timely manner.

d. Aerial Patrols

- i. Comprehensive Visual Inspections (CVIs) are performed annually on specified transmission structures, with the entire transmission system inspected over a six-year period. CVI is useful for identifying the following conditions from a helicopter: corroded insulator hardware, broken/damaged insulators, missing cotter pins, damaged crossarms, vegetation creep on tower legs, NESC clearance violations, damaged static wire or conductor, etc.
- ii. Aerial vegetation inspections take place in a helicopter and normally occur at a slightly higher elevation and speed than the comprehensive visual inspections. Annual transmission vegetation patrols focus primarily on vegetation, but additionally report any conditions found on equipment or encroachments. These patrols include personnel from Duquesne Light's Vegetation Management Department in addition to a contracted line observer.

e. Infrared Inspections

Duquesne Light identifies approximately one-fifth of its distribution circuits each year for inspection. An overhead line inspector typically drives each circuit (walking the ROW portions) performing a visual inspection and records the information generated from an infrared camera. Any emergent issues identified by the inspector are immediately reported to the Operations Center. Upon returning to the office, any visual observations, infrared pictures, and digital photos are noted and downloaded. A work order is created in the Company's work management system to track and address any deficiency or repairs needed. Each deficiency is assigned a priority based on the condition and type of equipment identified. A report, including any pictures, a description of each deficiency item,

and the work order are then sent to the appropriate field personnel to schedule repairs.

f. UAV (Drone) Use

Duquesne Light has successfully performed a drone inspection pilot program on transmission towers and an overhead distribution circuit to better understand drone limitations and report accuracy.

g. Any other relevant continual improvement activity

Duquesne Light audits a portion of all inspections to ensure accuracy. The Company is also pursuing the digitization of substation and overhead distribution inspection forms.

h. New Programs/New Technology Implementation

Duquesne Light did not implement any new technology or programs for preventative maintenance programs during the current reporting period.

iii. Capacity Planning

The Company annually performs an individual company assessment of the Duquesne Light area bulk electric system for the upcoming summer period. The summer seasonal assessment of local facilities ensures that the system can supply projected customer demands and projected Firm Transmission Services in accordance with Duquesne Light's local reliability standards. The complete analysis addresses Duquesne Light's transmission performance for the 2023 summer forecasted peak load of 2,742 MW. Included in this assessment are firm transmission upgrades.

Duquesne Light also participates in the PJM Interconnection, LLC (PJM) Operations Assessment Task Force (OATF) summer study and the ReliabilityFirst Corporation (RF) summer seasonal assessment. The OATF and RF studies have been completed and Duquesne Light's internal analysis is conducted annually. Based on the OATF and RF assessments, as well as the results of the Company's assessment of system conditions modeled for the 2023 summer period, the Duquesne Light bulk electric system is expected to sufficiently support the projected peak load under normal operating conditions.

Individual circuit load forecasting, along with bulk substation forecasting and contingency analysis are performed by the Distribution Planning Group on an annual basis. These planning tools are used by Distribution Planning to review loadings of distribution circuits and stations. Any capacity issues discovered during this process are addressed through engineering scopes of work along with any necessary business

case documents in an effort to allocate funding and resources to address capacity issues.

iv. Significant Storm Lessons Learned from 2022

As in past years, Duquesne Light continues to hold internal storm review meetings following all major outage events.

v. 2023 Summer Readiness

a. Capacity Additions

Duquesne Light's capacity additions within the past year on the Distribution/Subtransmission System are as follows:

- i. Portions of circuits that had previously been served by 4 kV step-down transformers off 23 kV circuits were converted to eliminate the step-down transformers and serve the load from a 23 kV source. These include portions of the following circuits:
 1. Woodville D23679: approximately 195 kVA of connected load converted from 2.4/4.16 kV to 13.2/23 kV
- ii. No circuits were upgraded from 4 kV to 23 kV, either wholly or partially.
- iii. DLC has no new 13.2/23 kV distribution circuits.
- iv. The following are new 23 kV subtransmission circuits:
 1. Riazzi-Bouquet No. 1 T22647
 2. Riazzi-Bouquet No. 2 T22648
 3. Riazzi-Bouquet No. 3 T22649
 4. Riazzi-Forward T22645
 5. Wolfe Run-ETC Compressor T22817

The Company's Transmission Planning group, along with PJM, continues to evaluate Duquesne Light's transmission system to identify system enhancement projects. Capacity improvements that were made to the transmission system over the past year are listed below:

- i. The Brunot Island-Crescent transmission corridor rebuild project's Phase 1 was completed in 2023 for lines Z-143 and Z-24, improving the reliability of Sewickley and Montour Substations.

b. Transmission Preparedness

Annually, Duquesne Light participates in PJM's Summer Emergency Procedures Drill which is conducted to assess the readiness of system operations personnel

during emergency conditions. The objectives of the drill are to ensure that the following occurs:

- i. PJM personnel and member companies understand emergency procedures;
- ii. Communication facilities are adequate between PJM and member companies;
- iii. PJM and member company personnel demonstrate effectiveness of corporate/governmental affairs communications; and
- iv. PJM, as a Regional Transmission Operator (RTO), as well as Local Control Centers (LCCs), and Marketing Operations Centers (MOCs) provide adequate information to governmental agencies.

Duquesne Light has recently designed an Emergency Transmission Structure Replacement program to respond to any event causing a failure of up to nine transmission structures, and capable of replacing 92% of all towers in the network. Due to the structures modular design, they can be utilized for 80'-160' heights and are able to support 138kV or 345kV conduits. Findlay Substation is the designated storage area for both the 2007 and 2021 sets of emergency structures and equipment, which is maintained by DLC's Material Management Department.

c. Event Preparedness

Duquesne Light utilizes a comprehensive written Emergency Operations Storm Plan (Storm Plan), which is updated at least annually and is currently under review. The purpose of the Storm Plan is to provide guidelines and procedures for managing the Company's response to service interruption events that result from any cause. Typically, Storm Plan use is required when weather events escalate the Service Interruption Classification to Yellow or Red as defined in the Storm Plan. However, the Storm Plan is also used to address Service Interruption Events caused by events other than weather.

The Storm Plan is designed to provide immediate response and subsequent recovery from any disaster.

The Storm Plan has been developed to:

- Use an Incident Command System (ICS) approach to manage the response and recovery activities following an unplanned incident or event; and
- Ensure communications with employees, customers, media, and regulatory agencies, as well as federal, state, and local governments to operate effectively and exchange accurate and timely information.

Duquesne Light also maintains a subscription to StormGeo, a premier weather forecasting service that provides customized forecasts once daily, severe weather alerts, and access to several web-based tools.

d. Training

Duquesne Light conducts Storm Preparedness Training each year for employees serving roles on the Storm Restoration Team. In 2023, Duquesne Light expanded the number of employees who participate in storm restoration efforts. Almost all Duquesne Light employees are now assigned a specific storm role.

e. Personnel Sufficient

As of May 20, 2022, Duquesne Light is recruiting internal and external candidates to fill open, essential positions, which does not include 25 Apprentice Lineworker positions that could be filled in September by students who are currently in our Electrical Distribution Technology program. Current openings can be viewed at www.duquesnelight.com/company/about/careers.

The DLC Talent Acquisition strategy is focused on providing hiring managers with a pool of highly qualified candidates to consider when filling vacancies. In addition to recruiting experienced candidates, DLC continues to host a formal Summer Internship program targeting rising juniors and seniors. The internship program provides the interns with professional work experience and an understanding of the company culture while enabling DLC to gauge the student's aptitude and growth potential as future employees. Between 2015 and 2022, DLC has extended 55 full-time job offers and hired 47 former interns into full-time roles.

EDT Program Description: The Electrical Distribution Technology (EDT) program is a joint partnership between Community College of Allegheny County (CCAC) and Duquesne Light to provide training in the basic skills, knowledge, and abilities applicants would need to apply for skilled craft positions in the electric utility industry. The program design, including pre-qualification testing and course content, is intended to not only produce candidates who possess the skills to safely and confidently perform the manual tasks associated with electrical utility work, but also build the foundational skills that will allow them to advance further in their careers.

The EDT program consists of a fast-paced and challenging curriculum that incorporates practical application of safety concepts and established work practices in the Overhead, Underground, and Substation Maintenance crafts with college level academic courses in computers, math, and electrical theory. Students attend classes Monday through Friday, both day and evening, to complete the one-year, 44-credit course, receiving a Certificate in Electrical Distribution Technology. Students are responsible for paying their own tuition for the classes at CCAC. There are two paid internships at the end of each semester as part of the program. Upon graduation, students who excelled during the program and

demonstrated the right skills and attitudes are considered for employment with Duquesne Light through its standard hiring practices.

f. Continuous Improvement

Duquesne Light is a participant in the Spare Transformer Equipment Program (STEP) managed by Edison Electric Institute (EEI). The program is a binding obligation to share transformers in the event of a triggered event as defined by Homeland Security. The binding obligation is an agreement to sell an obligated number of Duquesne Light's spare transformers to a company in need once a triggering event occurs. The program shares the burden of maintaining spare transformers proportionally across all participants.

To help restore electric service to communities after catastrophic emergencies or significant natural events, 18 utilities – including Duquesne Light Company – have now committed to participate in the Regional Equipment Sharing for Transmission Outage Restoration or RESTORE program, which establishes a proactive approach to providing critical equipment for utilities that need additional resources during disaster recovery. Formed in 2017, RESTORE is designed to enhance the resilience and reliability of the power grid and provide additional sources for utilities seeking critical equipment during disaster recovery and does not replace existing programs or agreements already in place. Duquesne Light Company's participation in the RESTORE program was approved by the Commission on March 15, 2018.

g. New Programs/New Technology Implementation

The Operations Center deployed a new Open Systems International (OSI) EMS SCADA system on April 28, 2020. This new system allows the company improved visibility into its operating system to more quickly identify and address issues as they arise.

vi. **Storm Response**

a. Outage Restoration Strategy

When the extent of storm damage to the electrical system is severe and widespread throughout the Duquesne Light service area, restoration activities must be prioritized. In all situations, the safety of the public, as well as those working to restore service, is always the overriding and highest priority. Duquesne Light follows these restoration priorities, which are generally universal throughout the electrical utility industry.

- i. **Public Safety Hazards:** The Company's first priority is to quickly address public safety hazards, such as wires that are down across major highways,

burning wires, or equipment or building fires. While downed power lines are being addressed, company personnel continue to assess the total damage to the electrical system's infrastructure and begin restoring service.

- ii. **Public Health and Safety Facilities (Critical Customers):** Repair work that restores power to essential facilities that provide critical services is a high priority. This includes hospitals, police, fire and emergency facilities, water and sanitary authorities, nursing homes and assisted living facilities, etc.
- iii. **Major Circuits:** Duquesne Light continues rebuilding its system by next focusing on major circuits as it strives to restore power to the greatest number of customers as quickly as possible.
- iv. **Small Neighborhoods/Individual Homes:** Once major circuits have been repaired, restoration efforts focus on smaller neighborhoods and groups of customers served by a single transformer. Finally, service to individual homes and businesses are restored as crews repair "service drops," which are the wires that bring electricity from the nearest pole to an individual building.

b. Communication and Outreach

During major outages and severe weather events, Duquesne Light uses various methods to keep customers safe and informed. These include updates to local media outlets when appropriate; postings on the company's social media channels, including Twitter, Facebook, and Nextdoor; updates on the corporate website; email messages to customers; and updates to local emergency management agencies. The company also implemented a new messaging platform that allows for targeted emails and text messages to be sent to a custom list. This platform is used to send messages to specific customers impacted by an outage when Duquesne Light is aware of a circuit lockout.

In addition to providing outage and restoration updates, Duquesne Light maintains a robust storm plan page on its website that outlines its storm response and restoration process, as well as how to prepare for a storm, what to do during an outage, and steps to take following an outage. Duquesne Light works with local news outlets and utilizes social media and email to share important content with customers before potential severe weather, including safety tips, how to report an outage and ways to prepare for possible power loss.

Duquesne Light also has a process for communicating storm damage and restoration information to elected officials. In advance of storm season, Government Affairs sends an email to elected officials and regulators throughout the service territory advising them of certain storm protocols and outage information. During severe weather events, elected officials and regulators are given outage and restoration updates when necessary.

Furthermore, Duquesne Light provides a public outage map that is used as part of the company's Power Restoration Update Center (PRUC) website. The PRUC is activated when the company experiences a severe weather event.

With Duquesne Light's comprehensive storm plan and team, storm-related communications are more synchronized and strategic across various groups. This coordinated process has greatly improved how the company communicates to internal and external entities before, during and after critical outage events.

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

Duquesne Light's Best Practices Implemented:

- i. The Company has designed its 23kV radial distribution system with normally open tie points to other circuits allowing for switching to restore customers faster during a storm.
- ii. Installation of the Intelliruptor which provides pulse reclosing and limits the number of customers experiencing an interruption as the circuit attempts to isolate a fault condition.
- iii. The transmission and distribution systems are also continually monitored to identify poor performing circuits. After a circuit has been identified, a maintenance plan is put in place to increase the circuit's reliability.
- iv. A Vegetation Management Plan is in effect to reduce the outages caused by trees during a reasonably expected storm event.
- v. The Company has a Storm Plan in place that defines restoration sequences and priorities. The Company also conducts training on its Storm Plan annually.
 - Duquesne Light adopted the principles of the National Incident Management System (NIMS) and its Incident Command System when managing widespread service outages.
 - The Company also increased its pool and use of supplemental trouble investigators and public protectors fostering an acceleration in identifying and protecting downed wires during a storm.

The Company belongs to two regional mutual assistance groups that are committed to providing restoration resources after a storm at no profit.

Duquesne Light's Best Practices Identified for Future Implementation:

- i. The Company is committed to the installation of an Outage Management System (OMS), which will provide customers with more accurate restoration information and give the Company the ability to restore power more efficiently during storm events. This OMS is targeted to go live near the end of 2022.

d. Any Other Relevant Continual Improvement Activity

Duquesne Light continues to provide Company representative staffing at the Allegheny and Beaver County EMS 911 Center, when requested, for utility representation during major events.

The Company is an active member in the CIIWG (Critical Infrastructure Interdependency Working Group), whose mission is to improve lines of communication between critical infrastructure partners and to encourage cooperation amongst members in order to better prepare for, and respond to, issues involving lifeline functions that support critical infrastructure sectors, and for the gathering of data, best practices and other information in order to produce deliverables that achieve improved communication and cooperation and increase resiliency.

e. New Programs/New Technology Implementation

Duquesne Light did not implement any new technology or programs for storm response during the current reporting period.

vii. Supply Chain Issues

a. Procurement concerns for equipment/materials

The supply chain and procurement teams are proactively taking steps to address longer material lead times. Our teams regularly meet with our key suppliers to discuss market conditions and outlook for key commodities. It is important that we continue working internally and with our suppliers to anticipate demand, prioritize materials and change plans when appropriate.