

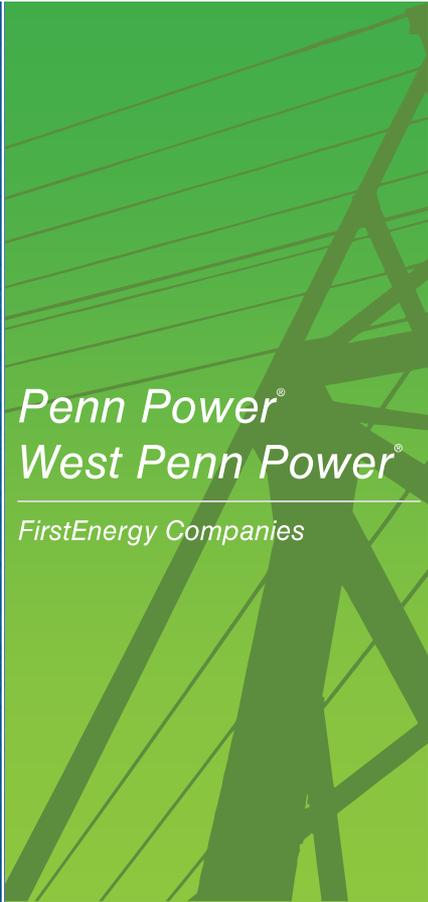
# Service Restoration Vegetation Management Scheduled Maintenance Recent Issues

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2020

A vertical green panel on the right side of the slide, featuring a stylized, semi-transparent image of a power transmission tower and its associated lines.

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# Large Event - Planning and Preparation

## ■ Preparations begin several days before a storm strikes

- Company meteorologists monitor weather data and track storm movement
- Company leadership, operations and other personnel plan and pre-stage for service restoration efforts
- Evaluate need for internal crews and external mutual assistance workers
- Prepare staging areas for crews, equipment and supplies
- Implement proactive, comprehensive communications strategy for reaching customers, local officials and media



# Large Event - Service Restoration Process

## Damage Assessment After Storm

- **Hazard responders go into field to assess damage to electric system and identify hazards**
  - Line crews isolate trouble locations, make them safe and restore service, if possible

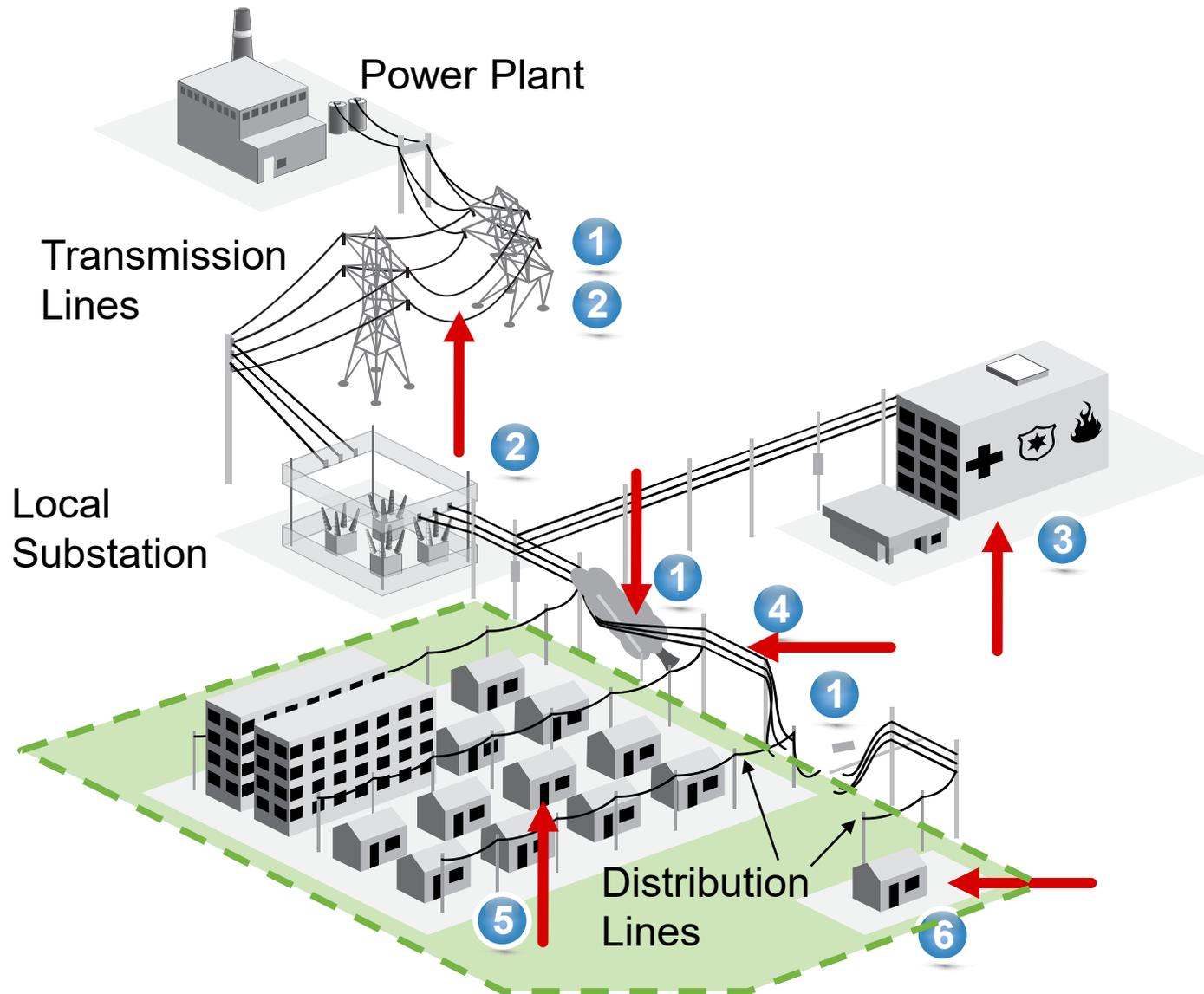
## Service Restoration Priorities

- **Emergency restoration efforts performed in stages**
- **Top priority is eliminating known hazards**
- **Repairs are made to high-voltage transmission equipment, lines and substations to restore service to greatest number of customers**
- **Crews then restore service to emergency response facilities**

# Service Restoration Process

1. Isolate and make safe; assess damage
2. Repair high-voltage lines/restore essential functions
3. Clear closed roads, restore hospitals and critical facilities
4. Repair main feeder/distribution lines
5. Restore areas with largest number of customers
6. Restore individual homes

*Although this is the preferred process during major service restoration efforts, the order may change due to specific conditions.*



# Safety is Top Priority

- **Safety representatives work alongside crews to reinforce safety procedures and practices**
- **Hazard assessors identify downed and potentially energized wires and other equipment**
  - Assessors remain at those locations to protect the public until linemen safely isolate or clear the hazard
- **Forestry crews clear fallen trees and branches so line workers can safely repair and re-energize lines**



# Large Event - Communications Outreach

- **Communicate with local emergency management agencies and 911 coordinators**
- **Customer Contact Center**
  - Call center staffing increased to manage potentially large customer call volume
  - Provide information through interactive voice response (IVR), outage website and customer service representatives
- **Twitter and Facebook provide continual updates**
  - Power restoration progress
  - Water and ice availability
  - Shelter locations and safety information
- **24/7 Power Center: [www.firstenergycorp.com/outages](http://www.firstenergycorp.com/outages)**
  - View the status of reported outages or see if there are known outages in the area



# Normal Daily Restoration Process

- **Outage is reported by customers calling our contact center at 1-888-LIGHTSS**
- **911/EMA sends us notifications that include: accidents, downed lines, road closures, etc.**
- **Order is dispatched to closest crew. Person on Duty/Lines Supervisor is also notified for incidents involving accidents and larger outages**
- **Customer calls are utilized by our outage management system help to access impacted area. Customer calls and 911/EMA reports can also contain information to help us locate the trouble.**

# Normal Daily Restoration Process

- **The crew's first priority is to analyze the trouble and make the scene safe.**
- **Scope of trouble is determined and plan for restoration of service is determined.**
- **Plan includes:**
  - Isolating trouble and restoring as many customers as possible. Input from crew, dispatch center, lines supervisors and planning engineers may be needed to determine available switching opportunities to restore as many customers as possible.
  - Switching opportunities can include, circuit line ties, substation switching or transmission line switching.

# Recent Large Outages - Upper St. Clair

## ■ **December 9, 2019 – Outage involved 1332 customers**

- Involved McLaughlin and Brookside Circuits. Circuits were temporarily tied to complete upgrade of substation.
- Caused by a large off right of way tree falling into the line.
- 3 broken poles and 7 additional poles needed worked.
- Line opened at 10:24 am. line switching was completed to restore 636 customers at 2:15 pm.
- Additional line switching was performed to restore 692 customers at 2:20 pm.
- 47 customers were determined not to be involved in the outage.
- Remaining 4 customers were restored at 7:29 pm

# December 9, 2019 – Off Right of Way Tree



# Recent Large Outages - Upper St. Clair

## ■ **December 13, 2019 – Outage involved 1332 customers**

- Involved McLaughlin and Brookside Circuits. Circuits were temporarily tied to complete upgrade of substation.
- Caused by an off right of way tree falling into the line
- Line opened at 6:40 pm. Line switching was performed. Opened switch and closed circuit at 7:17 pm picking up some customers.
- Additional switching was performed to isolate trouble and remaining customers were picked up at 10:25 pm.
- Isolated broken arm was replaced following day.

# December 13, 2019 – Off Right of Way Tree

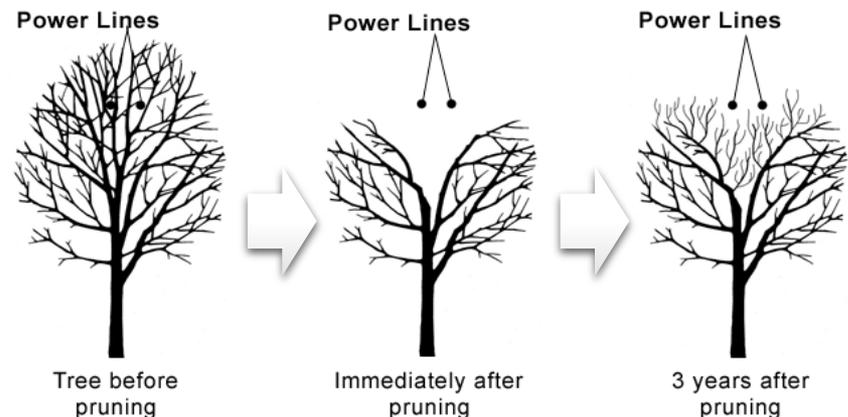


# Vegetation Management

- **Trees are the leading cause of electrical power outages**
- **To help maintain safe, reliable electric service, FirstEnergy's Vegetation Management Program controls trees, shrubs and brush growing around our facilities and equipment - including power lines. Every five years or so, trained, qualified line clearance experts visit your neighborhood looking for trees that may come in contact with electrical conductors. Working toward a four year cycle.**
- **If a tree needs pruning, the property owner is notified - either in person or through a door card - before work is started. An approximate time frame for completion of the work is noted on the card.**

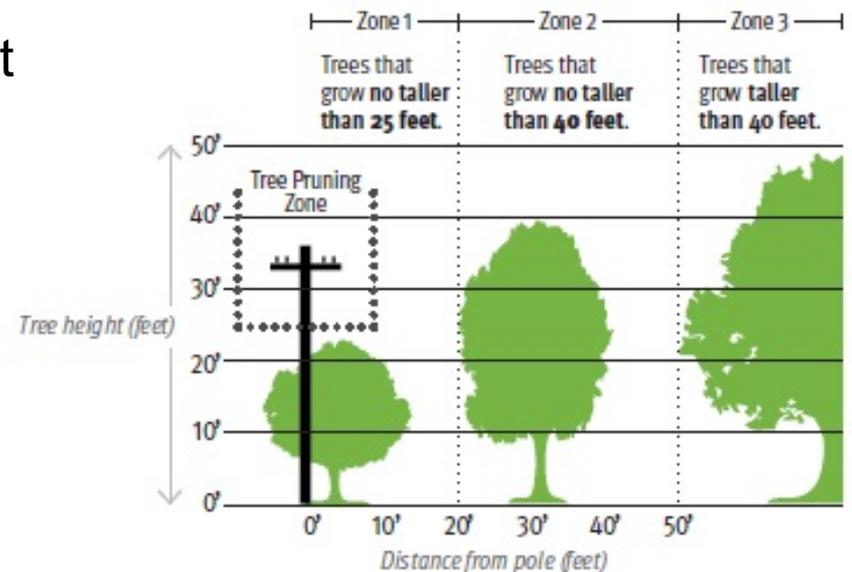
# Vegetation Management - Distribution System

- **Trees are trimmed to provide enough clearance between limbs and lines for safe and reliable service**
- **Fast-growing trees near power lines are removed**
- **Except in an emergency situation, an attempt to notify the property owner is made prior to tree removal**
  - If the tree is interfering with the service drop, or wires running from utility pole and the customer's home, the homeowner will be responsible for removal



# Distribution System Proper Tree Placement

- **Zone 1: within 20 feet of distribution line**
  - Small trees that grow to a mature height of 25 feet or less
- **Zone 2: 20 to 50 feet from distribution line**
  - Trees that grow no taller than 40 feet
- **Zone 3: 50 or more feet from line**
  - Trees that grow taller than 40 feet
- **Call 8-1-1 before planting trees and shrubs to have lines marked and avoid unsafe conditions**



# Upper St. Clair - Vegetation Management

- **St Clair Substation/Skyridge Circuit - 2020**
- **St Clair Substation/Lesnett Circuit - 2024**
- **St Clair Substation/McLaughlin Circuit - 2023**
- **Bethel Park Substation/Clifton Circuit - 2022**
- **Bethel Park Substation/Dashwood Circuit - 2021**
- **Peters Substation/Bebout Circuit - 2021**
- **Crossgates Substation/Peters Twp Circuit - 2020**
- **St Clair Substation/ Brookside Circuit - 2022**

# Maintenance Inspection Cycles

Program	Cycle (Years)
OH Circuit Inspections	6
Pole Inspections	12
UG Padmount Inspections	5
Capacitor Inspections	1
Recloser Inspections	1
Infrared Inspections	3

# Maintenance Programs

- **Overhead Circuit Inspections – Entire circuit is visually patrolled and all issues are identified.**
  - Poles, crossarms, wire, insulators, guys, transformers, cutouts, etc.
  - Serious issues are addressed immediately
  - Other issues are addressed the following year
  
- **Pole Inspections – Contracted to OSMOS – all West Penn Power owned poles are inspected.**
  - Priority one poles are replaced with 90 days
  - Priority poles are replaced at a later date
  - C-Truss poles are completed within next year

# Maintenance Programs

- **Underground Equipment Inspections – Entire circuit is visually patrolled and all issues are identified.**
  - Inspect all locking mechanisms
  - Inspect for holes and washout
  - Check for tilt
- **Capacitor inspection/replacements**
- **Reclosure inspection/replacements**
  - Age and duty determine replacement
- **Infrared inspections – contracted to OSMOS**
  - Involves looking for hot spots on main three phase line

# Upper St. Clair Maintenance Inspection Cycles

Substation and Circuit	Next Overhead Line Inspection	Next Pole Inspection	Next Underground Equipment Inspection	Next Capacitor & Recloser Inspection	Next Infrared Inspection
St Clair SS/Skyridge	2021	2021	2023	2020	2021
St Clair SS/Lesnett Circuit	2025	2025	2023	2020	2022
St Clair SS/McLaughlin	2024	2024	2023	2020	2021
Bethel Park SS/Clifton	2020	2026	2021	2020	2020
Bethel Park SS/Dashwood	2020	2026	2021	2020	2020
Bethel Park SS/Brookside	2022	2022	2021	2020	2020
Peters SS/Bebout	2022	2028	2022	2020	2022
Crossgates SS/Peters Twp	2020	2026	2024	2020	2020

# Current Reliability Issue - Upper St. Clair

## ■ Bethel Park Substation Clifton Circuit Momentary Interruption Complaints due to reclosure operations.

- Tollgrades installed on 11/23/2019 to record fault currents associated with momentary interruptions. Notice sent to engineer for review.
- 2020 line inspection included drone used to perform patrol of line where 25kV Sub-transmission overbuilds the distribution. 17 maintenance issues identified that will have follow-up in 2020.
- 2020 line inspection performed. 22 maintenance issues identified that will have follow-up in 2021.
- Forestry completed out of cycle, off right of way tree removals and on right of way trimming in 2019 and 2020.