

# **Summary Report on the Response of the Electric Distribution Companies Affected by Winter Storms Riley & Quinn**



**March 1-8, 2018**

**Prepared By:**  
**Bureau of Technical Utility Services**  
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## INTRODUCTION

Two Nor'easter winter events during the first week of March 2018 significantly impacted the Commonwealth of Pennsylvania and its electric distribution companies (EDCs). The first storm (Riley) began on Thursday, March 1, 2018, and lasted until Saturday, March 3, 2018. Riley was a powerful storm that produced high wind gusts up to 60 MPH, and rain that changed into heavy, wet snow throughout Pennsylvania. The biggest storm impacts were experienced in the Southeastern, Eastern, and Northeastern regions of the Commonwealth (Greater Philadelphia area, Lehigh Valley, and the Pocono Mountains). The saturated soils, heavy snow and high winds caused downed trees and power lines, infrastructure damages, and widespread transportation issues. These storm conditions caused approximately 680,000 electric customer outages at the peak, which occurred at approximately 11:00 p.m. on March 2.

On March 7, 2018, a second winter storm (Quinn) delivered additional heavy, wet snow, and high winds into the Commonwealth. Quinn delivered wind gusts up to 25 MPH and additional snowfall accumulations of up to 14 inches in the same areas already trying to recover from the first storm, as Quinn arrived prior to the completion of electrical restoration from Riley. The electric outages caused by Quinn were generally much less severe than Riley with the exception of PECO Energy Co. (PECO) in Bucks County. PECO's total system outages increased from approximately 12,000 as of 8 a.m. on March 7, to approximately 100,000 at 8 p.m. However, Quinn complicated and prolonged restoration efforts in most areas. In terms of the outages caused by Riley and Quinn, the clear majority of customers (83.3 percent of the peak) were restored by 8:00 p.m. on March 5 and all customers were restored by March 13 at 11:10 a.m. Only a small number of customers in the Pike County Light & Power Company territory remained out until March 13 as customers in the other company service territories were restored by March 11 at the latest.

To illustrate the damaging effects of Winter Storm Riley, which began in the evening hours of March 1, 48.6 percent of Metropolitan Edison Company's (Met-Ed's) total customers (272,928) were affected, and Met-Ed restored their last impacted customer on March 11 at approximately 11:00 p.m. Because Quinn only caused significant new outages in the Bucks County region of PECO, and those outages were restored relatively quickly by PECO, this report deals primarily with the impacts of Riley.

The Pennsylvania Public Utility Commission (PUC) jurisdictional EDCs that were primarily impacted by Riley were Met-Ed, Pennsylvania Electric Company (Penelec), PECO, PPL Electric Utilities Corporation (PPL), and Pike County Light & Power Company (PCLP).

The number and duration of Riley-related outages warranted a review of the EDCs' preparation and response by the PUC's Bureau of Technical Utility Services (TUS). This review is based on a combination of the EDCs' reports required by Commission regulations, telephonic and email conversations with the EDCs throughout the restoration period, and information from subsequent meetings and communications with EDCs and other stakeholders. This includes after-action review meetings held by the Pennsylvania Emergency Management Agency (PEMA) and Pike County Emergency Management, as well as a public input session conducted by the Borough Council of

Stroudsburg, and a hearing by the Pennsylvania House Majority Policy Committee. Weather information about both the forecasted and actual impacts of Riley is also included.

This review contains 12 recommendations based on the information above, as well as the storm response best practices memorialized at 52 Pa. Code § 69.1903.<sup>1</sup> The PUC will follow up on all recommendations. The EDC storm response best practice working group reports to TUS on completed or ongoing initiatives. TUS will direct the EDCs to report on the progress or completion of all recommendations by the first week in September of 2019.

Some of the recommendations are worth highlighting here. Many customers at the Pike County Emergency Management and Stroudsburg post-storm meetings expressed frustration with inaccurate or changed (longer duration) restoration estimates from Met-Ed. These are ongoing problems within the industry that EDCs continue to work on and refine processes around. Other recommendations relate to coordination with EDCs and county and local emergency management prior to actual events to ensure expectations of all parties are met during events. TUS also has recommendations related to off-right-of-way trees due to their impact in this event and on electric reliability in general. Finally, TUS recommends that EDCs work together on planning and preparation for future climate impacts as they develop strategies to improve resiliency and storm response.

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<sup>1</sup>See here: <https://www.pacode.com/secure/data/052/chapter69/s69.1903.html>.

## **EXECUTIVE SUMMARY**

The dedication and service of all utility workers should be commended as they worked under very difficult circumstances responding to Riley and Quinn. As with any storm review, it is important to study the utilities' preparation and response by looking at what went well and what can be improved. This review includes key findings and a recommended course of action to address these conclusions. Industry best practices that would benefit other utilities facing such challenges also are noted throughout the report.

### **Key Findings**

- The affected EDCs successfully used social and traditional media to communicate with customers before and during the ice storm.
- In general, the EDCs worked effectively with elected officials, county emergency management, and local emergency management.
- EDC daily informational conference calls with state and local elected officials and local emergency management continued to be well received.
- The staffing of county 911 centers and/or emergency operations centers (EOCs) with EDC liaisons during large-scale events is largely beneficial and continues as a best-practice.
- There appeared to be issues with the expected capabilities and information provided by the Met-Ed liaison to Pike County Emergency Management.
- The forecast uncertainty and geographic scope of the projected impacts of Riley appeared to have impacted the ability of the EDCs to bring in the desired number of mutual aid resources before the storm hit.
- Off-ROW trees appeared to be a primary cause of outages (see Appendix B, Questions 31 and 32).
- The vehicle restrictions on state roads presented challenges to the EDCs as they sought to bring resources in to the base camps utilized for outside mutual aid and contractor resources. EDCs and the PUC were not involved in the vehicle restriction discussions and the PUC was asked by the EDCs to request waivers for utility and contractor vehicles.
- EDCs may have issues with county emergency managers where the EDCs have not met in the past year with county emergency management to discuss response and restoration expectations.
- In certain circumstances, especially in areas with limited highway options, county emergency management may want the EDCs to prioritize road closures involving downed wires over restoration of critical infrastructure.
- Met-Ed did not begin its damage assessment process until March 5, 2018, and concluded on March 11. This is two days later than PECO and 3 days later than all of the other EDCs (see Appendix B, Question 30 on page 81).

- It appears that the delay in Met-Ed's initiating its damage assessment process contributed to a longer duration of outages, especially in the Monroe and Pike County areas.
- It appears that local, county, and state officials would benefit from periodic updates on the progress of Met-Ed's reliability improvement work in Monroe and Pike Counties as these efforts may improve storm response and resiliency.
- It appears that Met-Ed could have alleviated some of the concerns in regard to its restoration efforts if it more effectively communicated its restoration strategy to the public and local and state officials during its elected official calls and through the media and its webpage, especially for those areas most impacted.
- It appears that local, county, and state officials would benefit from periodic updates on the progress of PPL's reliability improvement work completed in Pike and Monroe Counties as these efforts may improve storm response and resiliency.

### **TUS Recommendations:**

Note: Recommendations are followed up in parenthesis with current status update or comments.

- **Recommendation 1:** EDCs should continue their cooperation and communication with county 911 centers and emergency management agencies (EMA) and continue to offer liaisons for expected major service outage events.  
  
(TUS will work with the EDC storm response best practice working group on this issue.)
- **Recommendation 2:** EDCs should meet with each county in their service territories at least annually to review emergency procedures and expectations for responses, road closures, and the EDC liaison processes.  
  
(TUS will work with the EDCs to ensure this occurs.)
- **Recommendation 3:** During significant weather events that may cause utility infrastructure to be involved in road closures, EDCs should work with county emergency management to ensure consensus on the priority of work in addressing public safety, which may be opening priority roads before addressing priority restoration. This may be discussed in the meetings outlined in Recommendation 2, above.  
  
(TUS will work with the EDC storm response best practice working group on this issue.)
- **Recommendation 4:** EDCs should continue to collaborate on a best practice for managing estimated time of restoration (ETRs), especially during major service outage events.  
  
(The EDC storm response best practice working group continues to work on this issue.)
- **Recommendation 5:** An informal reliability investigation of Met-Ed should be initiated for Met-Ed's delay in initiating its damage assessment process, and in particular the damage assessment process for the quarantined circuits in Monroe and Pike Counties. Alternatively, the matter may

be referred to the Bureau of Investigation and Enforcement for such actions as it deems necessary.

(TUS will work with Law Bureau and the Commissioners' Offices on the recommended action.)

- **Recommendation 6:** The PUC suggests that it may be beneficial to hold a coordinating discussion with Emergency Support Function 1 – Transportation (ESF 1) primary and support agencies on the subject of closure and/or restrictions of certain vehicles on state roads during weather events, including a discussion of parameters of potential waivers, including hours of service waivers.

(TUS will follow up with the ESF 1 primary and support agencies on this recommendation.)

- **Recommendation 7:** While outside the jurisdiction of the Commission, TUS recommends EDCs consider approaching the Pennsylvania Legislature for possible relief that will grant utility companies the authority to remove or trim danger trees that are off their existing ROW. Such relief could be the ability to establish a wider ROW or allow utilities the authority to trim or remove trees that can potentially fall onto power conductors.

(TUS will work with the EDCs on this suggestion.)

- **Recommendation 8:** EDCs should work with local and county authorities on proactive measures to identify and remove off-ROW danger trees that can fall in to roads. EDCs should also work with those same entities on ensuring the proper species of trees are planted within 60 feet of primary electrical conductors.

(TUS will follow-up with the EDCs and the Energy Association of Pennsylvania on this suggestion.)

- **Recommendation 9:** EDCs should consult with experts on climate, in particular the climate of Pennsylvania and the northeast, in order to understand the expected and/or potential impacts to utility infrastructure due to ongoing and projected climate changes.

(TUS will task the EDC storm response best practice group with working on this issue.)

- **Recommendation 10:** EDCs should consider storm hardening and climate adaptation as programs to be addressed through modified or future LTIPs, especially as informed by information gleaned from Recommendation 9, above.

(TUS will work with EDCs on this issue.)

- **Recommendation 11:** EDCs that do not currently have LTIPs, such as PCLP, should consider the potential benefits to having an LTIP and DSIC as means to improve resiliency and reliability.

(TUS will work with EDCs on this issue.)

- **Recommendation 12:** TUS will incorporate the following practices for future emergency events:

- PUC Agency Representatives (AREPs) will ask EDCs to report the counties that the EDCs have active liaisons deployed with in the EDC outage reports;
- After 24 hours have passed from the onset of a weather disaster, PUC AREPs will poll the applicable PEMA Regional Offices for any coordination issues that impacted counties may be having with jurisdictional utilities;
- TUS will request the EDCs' storm damage model predictions before potential high-impact events, such as Riley (see Appendix B, Question 37); and
- TUS will request a summary of the lessons learned from each EDC in regard to the EDCs' after action reviews (see Appendix B, Question 36).

(TUS will add the items to its standard operating procedures for AREPs and for Storm Response Procedures.)

## **REVIEW**

The following information highlights items that are relevant to the discussion of the utilities' preparation and response to Riley and Quinn. Information such as restoration times, utility crew staffing levels and communication efforts specific to the EDCs and provided to the PUC begin on page 13.

### **I. State Preparation**

Recognizing Riley's potential to be a serious threat to the Commonwealth, PEMA began issuing National Weather Service (NWS) briefings on Feb. 27 and continued through March 7. See Appendix C for the forecast and actual impacts of the weather event. State agencies were encouraged to be forward-leaning and formulate staffing plans for the Commonwealth Response and Coordination Center (CRCC). As can be seen in Appendix C, on Feb. 28, the NWS reported Riley was going to affect southcentral, central, and northeastern Pennsylvania with wet snow and high winds, with the main impact forecasted for March 2. The forecast at that time was highly uncertain and covered a large area of the nation, including most of the mid-Atlantic and northeast states. It was not until the morning of March 1 that the forecast was certain that the northeast quadrant of Pennsylvania would be impacted with heavy snow, and the southcentral and southeast would be impacted with sustained winds of 20-35 mph and gusts up to 60 mph. On March 2 at approximately 2:00 p.m., PEMA activated the CRCC to an Enhanced level, meaning Emergency Preparedness Liaison Officers (AREPs) from various state agencies, including the PUC, were requested to report and support the state response. The PUC and other key agencies reported to the CRCC at 3:30 p.m. on March 2 for 12-hour shifts on a 24-hour basis until the late afternoon of March 4.

On March 5, the Governor's Office and PEMA held a special planning session with state agencies such as the PUC, PennDOT, Pennsylvania State Police (PSP), Department of Military and Veteran's Affairs (DMVA), the Turnpike Commission (Turnpike), Department of Public Welfare (DPW), Department of Health (DOH), and the Red Cross. As a result, the Governor's Office issued an emergency proclamation enabling the use of state resources to aid Pennsylvania citizens and critical infrastructure. PEMA, through the CRCC and state agencies present, coordinated the state response efforts and resource requests. PEMA also held a similar call on March 6 to discuss preparations for the snow expected from Quinn.

### **II. PUC Preparation**

The PUC's Lead AREP coordinates the emergency response actions of the PUC and is responsible for staffing the CRCC with PUC AREPs as required. The PUC has 16 staff members, including the Lead AREP, who are qualified as AREPs. The Lead AREP also ensures communications regarding any regulated utility service interruptions or emergencies flow between the utilities, CRCC, and key PUC staff such as Commissioners and their staffs, bureau directors, managers and supervisors.

For Riley, the Lead AREP emailed the EDCs, as well as the large water/wastewater and telephone utilities, on the morning of March 1, to provide information from the weather briefing. The Lead AREP also requested that utilities provide information on their preparations and if they were anticipating

weather-related outages.<sup>2</sup> As noted, above, the weather forecast before then was unclear on how impactful the event would be on Pennsylvania.

The Lead AREP was notified in the early morning of March 2 by Penelec, Pennsylvania Power Company (Penn Power), and West Penn Power Company (West Penn) that those EDCs were experiencing service outages in the western part of the state. As the day progressed, the EDC service outages increased, primarily in the eastern part of the state. Met-Ed, PECO, PCLP, Penelec, and PPL were the EDCs most impacted. As noted, above, PEMA requested PUC AREPs to report to the CRCC on March 2. On March 2 at 3:30 p.m., the Lead AREP and his Supervisor began staffing the PUC Desk at the CRCC. The Lead AREP also emailed the utilities about the activation and asked them to report the statuses of local elected official conference calls, utility company liaisons in County Emergency Operations Centers, and critical infrastructure impacts and resource needs. In that same email, the Lead AREP provided the PUC AREP contact information for the CRCC and established a recurring electrical outage reporting schedule with the EDCs. The Lead AREP also emailed all Commissioners and key PUC staff on March 1 and March 2 regarding the storm concerns, activation, and utility response measures and anticipated challenges.

Throughout the response, the Lead AREP worked with the EDCs and gathered and disseminated information on the expected internal and external personnel resources, including linemen, forestry crews and assessors that were expected to be available to respond. The summary of the EDC preparation information is presented below. The response shows the EDCs had already planned on significantly increasing their staffing of both internal and external sources. The PUC provided the EDC preparation information to PEMA.

PEMA activated the CRCC for the expected heavy snows from Quinn and PUC AREPs worked 12-hour shifts beginning on March 7 at 8:00 a.m. until 12:00 p.m. on March 8, 2018, when the activation level of the CRCC was lowered and the additional state AREPs were demobilized. During the CRCC activations for Riley and Quinn, the PUC AREPs monitored and reported on utility service interruptions while addressing any critical customer outages such as nursing homes, hospitals, and water treatment plants. Fortunately, no large-scale water service interruptions occurred due to power loss. Some localized landline telephone outages occurred due to storm damage, but there were no significant outages.

In the afternoon on March 3 and at 8:00 p.m. each evening of March 4, 6, and 7, the PUC held PUC Chairman Operational Calls with the senior staff of the EDCs and other fixed utilities.<sup>3</sup> These calls were initiated as a best practice after their use in Hurricane Sandy in 2012. The PUC also invites the Governor's Office and the PEMA Director to the calls along with the utility presidents and operational directors. The calls are focused on sharing outage information and restoration statuses. Utilities also noted any unmet needs or obstacles to restoration the state could possibly address.

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<sup>2</sup> The PUC also includes the Pennsylvania Rural Electric Association (PREA) in emails to jurisdictional utilities. While the PUC does not regulate PREA members, the PUC and PREA regularly exchange information during severe weather events and other incidents as necessary.

<sup>3</sup> Fixed utilities include electric, water, wastewater, landline telephone, and natural gas.

### III. Utility Preparation

Below are highlights of the steps taken by the affected EDCs before Riley and Quinn impacted Pennsylvania. As noted in the Introduction, the report is limited to the EDCs that were primarily impacted by the storms.

- **Met-Ed**

- After receiving the weather forecast on Feb. 28, 2018, Met-Ed began storm preparations and initiated the first storm call on March 1 at 11AM. Met-Ed began staffing its customer operations centers with line, substation, forestry, and fleet personnel on March 1 to prepare for the anticipated impact beginning overnight between March 1 and March 2, 2018. Met-Ed continued logistical planning and storm preparations, which included:
  - Defining key daily safety messages for the physical workforce based on the magnitude of the predicted event
  - Reviewing weather forecasts and assessing anticipated geographical impacts
  - Reviewing available resources and establishing resource needs by location
  - Reviewing, establishing, and initiating external communications with governmental and community contacts
  - Reviewing Customer Contact Center staffing and messaging plans
  - Establishing a tentative critical customer communications plan
  - Initiating hospitality and securing lodging for external resources
- On Feb. 28, 2018, Met-Ed requested 160-line full time equivalent (FTEs) resources and on March 2, 2018, requested an additional 400-line FTEs and 200 damage assessor FTEs through the EDC mutual aid process. Met-Ed received a total of 604 line workers and 220 damage assessors/hazard responders over the time period of March 2 through March 8, 2018.

- **PECO**

- On March 1, 2018, at 09:00 a.m., PECO held an internal pre-event conference call to prepare for Winter Storm Riley. PECO finalized arrangements and activation of all storm centers, in addition to making field resources available to work the storm response for its Operation Control Center (OCC). All PECO storm centers were opened on March 2, 2018, at 08:00 a.m., including PECO's Emergency Operations Center (EOC), Distribution System Operations, and all Regions Storm Centers. PECO's EOC remained open until March 11, 2018 at 11:00 p.m. The field and back office staffing remained fully active without any break in restoration from Riley to Quinn.
- PECO did not relocate regional field resources, due to the smaller 'in reach' size of PECO's service territory in relation to the location of its existing service buildings. PECO noted that it was within reach to respond and adjust resources to locations as needed. Supply locations in the region activated additional staff, and prepared storm kits and replacement materials and equipment.
- On March 1, 2018, PECO contacted all Contractors of Choice to ensure resource availability numbers. PECO's affiliate, Exelon Utilities, was contacted for available

resources as well. Another affiliate, ComEd, provided contractor and utility company resources to PECO in anticipation of the storm impact.

- Foreign Crews were requested from Regional Mutual Assistance Groups (RMAGs), including the North Atlantic Mutual Assistance Group (NAMAG) and Southern Electric Exchange (SEE), with conference calls being held starting on March 1, 2018. Due to weather complications and resources already dedicated to Puerto Rico, many resources could not be mobilized until March 2, 2018 at 07:30 p.m. In total, 2,877 full time employees were acquired for the storms. Leading up to Winter Storm Quinn, PECO focused on public safety, health, schools, and road openings, and continued to hire additional contractors.

- **Penelec**

- Penelec began storm preparations as soon it received the weather forecast on Feb. 28, 2018. All Penelec storm leads were placed on alert by the Incident Commander. After receiving an updated forecast on March 1, 2018, operations personnel developed a plan to manage the storm and its damages. FirstEnergy-wide storm calls began on March 1, being held at 10:00 a.m. and 06:00 p.m. On March 1, 2018, at 11:00 a.m., Penelec's storm team calls began in preparation of the weather.
- From a research planning perspective, Penelec held troublemen and added linemen to cover the overnight hours of March 1, 2018. It added additional operators to work in the Distribution Control Center (DCC). Beginning at 11:30 p.m. on March 1, 2018, forestry crews were staged in Erie, Oil City, and Warren. Hazard, DCC, and storm analyst coordinator supervisors were identified. 25 two-man hazard crews were requested, and crews were split between Oil City and Altoona.
- Penelec requested 250 additional linemen on Feb. 28, 2018 at 11:15 a.m. Penelec requested that crews be on Penelec property by the end of the day March 1 and be ready by the morning of March 2, 2018. 138 additional linemen arrived on March 1, 2018, due to the limited resource availability from the mutual assistance process. Many member companies did not make resources available early due to the predicted weather impact in their own service territories.
- Penelec also requested 50 hazard FTE resources on Feb. 28, 2018, to be ready to work on March 2, 2018, but received only 32 hazard FTEs. 12 were staged in Oil City and ready to respond the morning of March 2. 10 hazard FTEs were staged and ready to respond the morning of March 2. 10 hazard FTEs were staged in Towanda and ready to respond the afternoon of March 2.

- **PCLP**

- After hearing of the potential storm development, PCLP contacted Orange and Rockland Utilities (OUR), OSMOSE, Nelson Tree, Harlan Electric Construction, Sussex Rural Electric Cooperative (SREC), and Corning Natural Gas Company from Feb. 28, 2018 through March 1, 2018 requesting support.
- As more information on outages and weather conditions in the western PCLP service area became known, PCLP requested OSMOSE, for damage assessment, to report March 2, 2018, with 8 FTEs; Nelson Tree to report March 2, 2018 with 4 FTEs; ORU for 3 or

more FTEs; and Harlan to advance 3 FTEs to arrive on March 4, 2018. PCLP also requested Harlan provide additional line and pole setting crews. In addition, MetroTek Electrical Services (MES) was asked to provide 5 FTEs (qualified linemen) to start March 3, 2018. By March 3, 2018, Nelson increased to 13 FTEs; by March 6, 2018, MetroTek increased to 11 FTEs; and by March 8 and March 11, 2018, Harlan increased to 11 and 16 respectively.

- **PPL**

- On Feb. 28, 2018, PPL conducted a system outage modeling based on the weather forecast, notified internal emergency response personnel of the hazardous outlook of the system modeling, cancelled any new time-off requested through the duration of the event, verified internal resources of line, electrical, trouble, and assessors by region, verified contractor line resources and notified contractor leadership to prepare for storm activation, and created damage assessment and restoration strategies per region based on predicted storm impact.
- On March 1, 2018, PPL updated the system outage modeling and conducted a pre-storm event planning call with key emergency personnel to discuss predicted outages and staffing strategies. PPL confirmed its Feb. 28, 2018 internal resources of line, electrical, troubleman, and assessors, along with contractor line resources and pre-arranged contractors for storm response on March 2, 2018, to the PPL Regional Command Centers (RCCs). PPL increased its troubleman staffing, staffing at the PPL system operations center, and overnight coverage of customer service representatives for the overnight periods of March 1 and March 2, 2018. Additionally, it began monitoring social media for storm related activity and posted storm preparedness information to the PPL Electric website. PPL prepared plans for housing and feeding accommodations for contractor resources and established and pre-arranged 24-hour staffing for the Company's Emergency Command Center (ECC) and RCCs in each of the Company's 6 operation regions for March 2, 2018.
- The ECC and RCCs were staffed for a March 2, 2018, 07:00 a.m. start, with 250 PPL line personnel, 55 contractor tree crews, and 185 contractor line personnel pre-arranged for storm response on March 2, 2018. Regional operating centers were sufficiently staffed.
- As the event continued, PPL requested additional line resources starting on March 2, 2018 at 10:30 a.m.:
  - On March 2, 108-line personnel were received.
  - On March 3, 64-line personnel were received.
  - On March 4, 11-line personnel were received.
  - On March 5, 277-line personnel were received.
  - On March 6, 213-line personnel were received.
  - On March 7, 7-line personnel were received
- On March 3, 2018, PPL created two material staging sites with 24-hour staffing near the greatest impacted regions. PPL received 95 contractor assessors on the same day.

#### **IV. Riley & Quinn Impacts**

The biggest storm impacts were experienced from Riley. Riley produced wind gusts up to 60 mph, and 1-2 inches of rain that changed into wet, heavy snow, with significant accumulations in the Northeastern Part of the Commonwealth. Please see Appendix C for the forecast and actual impacts of Riley. The biggest infrastructure impacts were experienced in the Southeastern, Eastern, and Northeastern regions of the Commonwealth (Greater Philadelphia area, Lehigh Valley, and the Pocono Mountains).

At 10:45 a.m. on March 1, the National Weather Service (NWS) expanded the Winter Storm Watch in north-central, northeast, eastern, and southeastern PA, and increased the projected wind gusts for south central PA. The saturated soil, high winds, and wet snow caused trees to damage transmission and distribution infrastructure and lines, telco lines, and caused downed trees and wires to close some roads, particularly in the heavily wooded areas of Pike County and northeastern PA.

As can be seen in Appendix C, there was great variability in the forecasted impacts each day from Feb. 27 through March 2. What was projected to be a major rain and flooding event morphed in to a major snow and high wind event. Appendix C also shows the regional impacts of Riley as several mid-Atlantic and northeastern states. Large regional events such as Riley can delay and reduce available regional mutual aid resources for EDCs. The information in Appendix A provides an overview of the number of customers impacted as compared to other large storms as well as the physical damages to key EDC infrastructure such as poles and wires. Riley was at least as impactful as Nika in 2014, but not as widespread in damage as Sandy in 2012.

To further complicate matters, on March 7, 2018 Winter Storm Quinn delivered additional heavy, wet snow, and more winds into the Commonwealth. The second storm delivered wind gusts up to 25 miles per hour and additional snowfall accumulations of up to 14 inches in some areas already trying to recover from the first storm. Quinn arrived prior to the completion of electrical restoration from Riley and complicated and prolonged restoration efforts. Due to the projected weather conditions of Quinn, the Commonwealth closed Interstates 84 and 370 certain times on March 6 and 7. These closures and the winter weather conditions that arrived on March 7 were in the same areas that were hardest by Riley. This complicated and prolonged the travel and work of EDC restoration crews. The EDCs worked to coordinate road openings with county staff, so crews could get to the downed lines and reopen roads. All these conditions delayed restoration efforts from several hours to days as utility crews could not work on overhead lines or travel to remote outages safely.

Overall, the forecasts enabled the EDCs to prepare for an impactful storm. However, the uncertainty of the forecast grew in severity as Riley approached and this limited the ability of regional EDCs to bring in additional resources ahead of the storm. Once the main impacts of Riley were felt, EDCs were able to significantly enhance their staffing from mutual aid utilities and contractors, as can be seen on pages 69 through 73 in Appendix B.

## V. Utility Restoration Response

Below are summaries of each EDC's response and observations of PUC staff based on the EDC's reports and telephonic and email conversations with the EDCs throughout the restoration period. It also includes information from subsequent meetings and communications with EDCs and other stakeholders. More information may be found in Appendices A and B. The summaries reference information that is contained in those appendices. For reference, the peak number of reported outages occurred at approximately 08:00 p.m. on March 2.<sup>4</sup>

- **Met-Ed**

- Restoration Efforts

- After 72 hours, Met-Ed restored approximately 68 percent of its customers from the peak number of outages (as reported to the PUC). Met-Ed restored approximately 75 percent of customers from the peak after 96 hours.
- Met-Ed had full restoration of service by March 11 at approximately 08:15 p.m., approximately 9.6 days after the initial outage. By comparison, Met-Ed was fully restored in 10 days after Hurricane Sandy and 4.8 days after Winter Storm Nika.
- Automated estimated times of restoration (ETRs) for Winter Storm Riley were suspended beginning at 08:21 a.m. on March 2. ETRs were resumed by March 7 at 11:00 p.m.<sup>5</sup> In areas affected by Winter Storm Quinn, automated restoration times were suspended at March 6 until March 11 at 11:00 p.m.
- As compared to similar storms from historical events, Met-Ed ranked Riley and Quinn second in terms of number and duration of outages, with approximately 49.22 percent of its customers experiencing a sustained outage. In comparison, approximately 54 percent of Met-Ed customers experienced a sustained outage during Sandy.
- There were several issues with Met-Ed's response in Pike County, mostly related to communications and coordination with Pike County Emergency Management (EM).
  - Pike County EM, through PEMA, requested assistance from the PUC on March 5 due to coordination issues with Met-Ed and an apparent lack of restoration progress. The PUC Lead AREP and PUC management requested that Met-Ed work with Pike County EM and send a liaison to Pike County EM to work through some of the issues. Met-Ed indicated that it would send a liaison to the Pike County EM.
  - On March 6, the PUC organized a conference call with Met-Ed, Pike County EM, and PEMA due to ongoing issues. PUC assumed that the Pike County EM needed assistance with road opening coordination, but Pike County EM also was concerned with the restoration progress and also needed assistance

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<sup>4</sup> NOTE: TUS used 8:00 p.m. on March 2 as the peak time as it matches up with the reporting periods established with the EDCs for the storm. The highest number of total customers out as noted on the outage web sites was approximately 680,000 at 11:00 p.m. on March 2. TUS was not able to analyze the peak outage percentages over time periods for PCLP due to some reporting inconsistencies during the event.

<sup>5</sup> EDCs that have outage management systems that automatically calculate ETRs via an algorithm (or similar means) will suspend automated ETRs during large scale events as automated ETRs are not accurate when such large-scale damages occur.

handling the numerous power outage calls it was fielding from residents, which took away from their ability to address emergency issues. Met-Ed and Pike County EM worked a technological solution for the customer calls.

- There appeared to be issues with the expectations and capabilities of the Met-Ed liaison and what Pike County EM and PEMA area staff expected the liaison would bring. Some of these issues were rectified with the March 6 call, but this highlighted a need for EDCs to ensure they are communicating with their county EM staff at least annually to establish expectations.
  - On March 8, the PUC conducted a conference call with Met-Ed operational staff to better understand the delays in restoration to the southern Pike County and northern Monroe County areas. As of 08:00 a.m. on March 8, Met-Ed was reporting approximately 18,000 customers still out of service with the majority in the region mentioned, above. This was not much of an improvement since March 7 at 08:00 a.m., when Met-Ed reported 20,622 out. Met-Ed detailed the extensive damage to the feeder lines from substations that fed those areas as the cause to the delay in the restoration to the area. Met-Ed noted they were operating under a quarantine approach, whereby circuits are isolated and deenergized so that work can be coordinated safely. However, since the majority of work was being performed on the backbone feeder lines, Met-Ed and mutual aid crews were not visible in the affected areas and this caused many questions to be raised anecdotally by stakeholders as to Met-Ed's efficient use of manpower. It appeared Met-Ed should have more effectively communicated its restoration strategy to the public and local and state officials.
- Media Use
    - Met-Ed used social media (Twitter and Facebook) in addition to traditional media (radio, TV, and newspaper) resources to provide information and restoration messaging before and during Riley and Quinn. Customers could also utilize text messaging services and the Met-Ed website to receive storm-related information. Met-Ed's Twitter followers increased by 15.9% and its Facebook likes increased by 74.8 percent.
    - Information provided through media included: company preparation and restoration plans, how to prepare for and report outages, safety tips, damage assessments, water and ice distribution locations, and photos and videos of storm damage and restoration.
    - Met-Ed's outage website had 178,556 total views during the storm event and subsequent restoration process.
  - Restoration Messaging
    - Met-Ed waits to release ETRs until the weather event exits the system and safety conditions are well enough to send damage assessment crews.
    - Customers could access ETRs through live agents, the IVR, and the website.
    - Met-Ed began providing order specific ETRs on March 3 at 07:37 a.m.

- **PECO**

- Restoration Efforts

- After 72 hours, PECO restored approximately 89 percent of its customers from the peak number of outages (as reported to the PUC). PECO restored about 96 percent of customers from the peak after 96 hours.
- PECO had full restoration by March 10 at 02:18 p.m., approximately 8.3 days after the initial outage. By comparison, PECO was fully restored in 9 days after Sandy and 7.6 days after Nika.
- Automated restoration times for Riley were suspended on March 2 at 01:40 p.m. ETRs were resumed on March 3 at 06:00 p.m. Automated restoration times for Quinn were suspended on March 6 at 10:00 p.m. until March 7 at 11:00 a.m.
- As compared to similar storms from historical events, PECO ranked Riley and Quinn third in terms of number and duration of outages, with 794,969 customers experiencing storm-related outages. In comparison, 845,703 customers experienced storm-related outages during Sandy.

- Media Use

- PECO used social media (Twitter and Facebook) and traditional media (Print, Radio, and TV) resources to provide information and restoration messaging during Riley and Quinn. Customers could also utilize PECO's website and Customer Preference Center texts to receive information. PECO's Twitter followers increased by 13.3% and its Facebook likes increased by 29.9 percent.
- Information provided through media included: cases of outages, outage reporting, restoration efforts, safety tips, ETRs, the number out outages remaining, numbers of crews working on restoration, nested outages, and downed powerlines.
- PECO's outage website had 2,913,168 total views during the storm event and subsequent restoration.

- Restoration Messaging

- PECO assigns ETRs based on length of the storm, number of customers impacted, and the estimated number of repair jobs needed.
- Customer specific ETRs for Storm Riley were available starting on March 3 at 06:00 p.m. ETRs for Quinn were available starting on March 7 at 11:00 a.m.

- **Penelec**

- Restoration Efforts

- After 72 hours, Penelec restored 100% of its customers from the peak number of outages (as reported to the PUC). All customers were restored by 96 hours.
- Penelec had full restoration by March 5 at 07:50 p.m., approximately 4 days after the initial outage. By comparison, Penelec was fully restored in 5 days after Sandy.
- Automatic ETRs for Riley were suspended on March 1 at 09:45 p.m. and were restored by March 4 at 11:00 p.m. Penelec was not significantly impacted by Quinn.
- As compared to similar storms from historical events, Penelec ranked Riley and Quinn as sixth in terms of number and duration of outages, with 15.61 percent of

customers experiencing a sustained outage. In comparison, 16.4 percent of customers experienced a sustained outage during Sandy.

- Media Use
  - Penelec used social media (Twitter and Facebook) and traditional media (Radio, TV, and Print) resources to provide information and restoration messaging during Riley and Quinn. Customers could also use Penelec's website to receive information. Penelec's Twitter followers increased by 1.47 percent and its Facebook likes increased by 4.15 percent.
  - Information provided through media included: how to prepare and report outages, safety tips, ETRs, downed power lines and tree reports, damage assessment, and restoration progress.
  - Penelec's outage website had 129,141 views during the storm event and subsequent restoration.
- Restoration Messaging
  - Penelec withholds ETRs until the weather event exits the system and safety conditions are well enough to send damage assessment crews.
  - ETRs are published simultaneously to all media resources.
  - Order specific ETRs began on March 2 at 12:51 p.m.

- **PCLP**

- Restoration Efforts
  - PCLP had full restoration by March 13 at 11:10 a.m., about 11 days after the initial outage. By comparison, Pike County was fully restored in 11 days after Sandy.
  - PCLP did not suspend ETRs during the event and had them available starting on March 3 at 10:36 p.m.
  - As compared to similar storms from historical events, PCLP ranked Riley and Quinn below its Top 3 storm events in terms of number and duration of outages, with 2,101 customers experiencing a sustained outage. In comparison, 4,487 customers experienced a sustained outage in Sandy.
  - PCLP appeared to work well with local and county responders and the PUC did not receive any requests for unmet needs from the County or PEMA for PCLP issues, even with the length of restoration.
- Media Use
  - Pike County used social media (Facebook) and traditional media (TV, Radio, and Newspaper) resources to provide information and restoration messaging during Riley and Quinn. Customers could also use Pike County's website to receive information. Pike County's Facebook likes increased by over 100 percent.
  - Information provided through media included: restoration efforts, safety tips, damage assessment, tree removal locations, line constructions, customers without power, and ETRs.
- Restoration Messaging
  - Pike County issued daily updates of damage assessment, vegetation removal, and construction/restoration crew scheduling, starting on March 3.
  - ETRs became available on March 3 at 10:36 p.m.

- The Customer Service Office remained open for 16-18 hours per day throughout the duration of the storm.
- **PPL**
  - Restoration Efforts
    - After 72 hours, PPL restored approximately 80% of its customers from the peak number of outages (as reported to the PUC). PPL restored approximately 91% of customers from the peak after 96 hours.
    - PPL had full restoration by March 10 at 02:45 a.m., approximately 8 days after the initial outage. By comparison, PPL was fully restored in 9 days after Sandy and 3.8 days after Nika.
    - Automated restoration times for Riley were suspended on March 2, starting at 08:00 a.m. ETRs were restored on March 3 at 01:00 p.m. PPL was not severely affected by Quinn to require ETR suspensions.
    - As compared to similar storms from historical events, PPL ranked Riley and Quinn ninth in terms of number and duration of outages, with 261,341 customers experiencing a sustained outage. In comparison, 523,936 customers experienced a sustained outage during Sandy.
  - Media Use
    - PPL used social media (Facebook, Instagram, and Twitter) and traditional media (Print, Radio, and TV) resources to provide information and restoration messaging during Riley and Quinn. Customers could also use the PPL Alerts System and its website to receive information. PPL's Twitter followers increased by 3.31 percent and its Facebook likes increased by 10.1 percent.
    - Information provided through media included: storm preparation tips, how to prepare for and report outages, safety tips, ETRs, restoration progress, pictures of storm damage and restoration, and ice and water distribution locations.
    - PPL's outage website had over 1.5 million views during the storm event and subsequent restoration.
  - Restoration Messaging
    - Order specific ETRs began on March 2 at 12:51 p.m.
    - PPL's website began outage messaging on March 1 at 11:30 p.m.

## **VI. PEMA After-Action Review and Other Post-Storm Meetings**

PEMA, in cooperation with the PUC and many state agencies, conducted an after-action review (AAR) on March 13, 2018, for the preparedness and response to the storms. The PUC and PEMA also attended a public meeting, along with members of Verizon, Met-Ed, and PPL, at the Pike County Emergency Management Agency on July 13. In addition to this, the PUC and Met-Ed attended a public meeting in Stroudsburg, PA on July 17. Met-Ed held a reliability and post-storm workshop for customers in East Stroudsburg on August 8. Finally, the Pennsylvania House Majority Policy Committee held a hearing on August 9 regarding the March power outages, storm response, and area reliability in general. The following are feedback, observations, and best practices from these meetings:

### March 13 AAR Meeting

The March 13 AAR discussion included PEMA, PUC and several other state agencies. The following strengths and recommendations for improvement were discussed:

- Lessons learned from Sandy and previous storms helped with enhanced coordination between the utilities, counties, and state government.
- Interagency and problem-solving coordination was exhibited, both remotely and in the CRCC. For example, the PA Department of Health, PUC and EDCs coordinated health facility prioritization, and the PUC, PennDOT and PSP coordinated the acquisition of a utility work travel waiver.
- The PUC worked with the EDCs, telco, and water utilities throughout the storms and utilities were very responsive to the state's needs (many calls and requests were made overnight and early in the morning).
- The local official conference calls conducted by the EDCs in the impacted counties were very well-received.
- Some counties were having challenges finding utility representatives to imbed in the County Emergency Operations Center, once requested.
- Some counties were having utility disruptions and subsequent challenges in coordinating effectively with the utilities for repair work.
- There was about a 12-18-hour time lapse from the time the road restriction/utility truck waiver was requested and obtained. The road closure, parameters of the waiver, as well as enforcement provisions of the waiver, should all be discussed up front when possible.
- It was suggested that PUC AREPs should poll the EDCs at the beginning of each shift to understand which counties have requested and received liaisons.
- It was suggested that after 24 hours into the event, PUC AREPs should poll the County EMAs, through the PEMA Regional Offices, to determine any coordination issues with the regulated utilities.
- PennDOT, PSP, and PEMA should consider granting an Hours of Service waiver for critical utility trucks and workers directly associated with power restoration efforts. The same applies to the road closure waiver for utility workers. If restoration is occurring in the areas of closed roads, critical utility crews directly involved in restoration should be considered in the travel waiver.

### July 13 Pike County Emergency Management Agency Post Storm Meeting

The July 13 session had participation from Pike County Commissioner Steve Guccini, Representative Mike Peifer, representatives of Verizon, Met-Ed, PPL PEMA, PUC, township officials, and members of the general public. The feedback centered on having a better understanding of utility response processes, communications from Met-Ed, utility representation in the County Emergency Operations Center, tree trimming and removal processes, and road opening processes. The PUC notes that Pike County Emergency Management did an excellent job of organizing the meeting and facilitating the discussion. It was clear that Pike County Emergency Management (EM) has a process for continual improvement of its response capabilities and communications and coordination with utilities and other responder agencies. A summary of the concerns expressed at the session follows:

- Some individual customers noted that they were upset with Met-Ed during the restoration due to Met-Ed notifying them their service had been restored when it had not.
- Customers indicated that Met-Ed ETRs kept changing.

- County officials and several residents expressed that there was delayed damage assessment and response from Met-Ed.
- It was discussed that Met-Ed should send a representative into the County Emergency Operations Center (EOC) sooner than occurred during the March storm. It was also noted that the County should ask for an EDC representative earlier rather than later to ensure their presence when needed.
- A good portion of the discussion focused on the greatest priority being the opening of roads by clearing debris and trees, and the necessary electrical safety work and removal of live and downed lines.
- Pike County EM and township public works staff discussed the needs of opening priority roads and that power restoration would be a secondary concern when priority roads are closed (due to the public safety aspect).
- It was discussed that telecommunications companies (Verizon in this instance) should have a representative in the County EOC when communications or telecommunications systems are severely disrupted or out of service.
- It was noted that there should be a combined effort in the County EOC (Verizon/Met-Ed/PPL/County/other agencies) to work together on the issues that require a coordinated response, such as road openings.
- It appeared that Pike County EM will continue the discussion with utility partners and coordination for future events should progress more smoothly.

#### July 17 Stroudsburg Borough Council Meeting Discussion

Mayor Tarah Probst and Stroudsburg Borough Manager Jennifer Maier made a request of the PUC to have PUC and Met-Ed presence at their July 17 Borough Council Meeting. PUC and Met-Ed provided personnel for the meeting. The primary purpose, as outlined by the Borough, was for customers to have a forum to raise reliability issues with Met-Ed and for Met-Ed to intake customer-specific issues. Met-Ed provided a form that customers could fill out and return to Met-Ed staff for follow up. PUC staff provided an overview of the informal and formal complaint process for customers and had various educational materials available. During the July 17 session, consumers participated as well as Borough Council members of Stroudsburg. Council members and Mayor Tarah Probst echoed consumer concerns about how to improve overall customer service, electric reliability issues and concerns, weighing the pros and cons of underground utilities, and other issues. A summary of the main concerns expressed at the session follows:

- There was a perception that PPL was more responsive to affected consumer needs than Met-Ed.
- The possibility for utilities to be moved underground was briefly discussed.
- Met-Ed customers that are small business owners expressed frustration with electric reliability in general and noted the impact to their businesses.
- Several individual Met-Ed customers noted frustrations with Met-Ed reliability as well as with restoration estimates and outage messaging.
- It was discussed as to whether Met-Ed and PPL could explore some tie-ins of facilities to provide power when PPL facilities are energized and Met-Ed facilities are not.
- It was discussed if it was feasible for customers to switch from Met-Ed to PPL. (NOTE – the PUC staff in attendance did not weigh in on this issue as this prospect raises several regulatory

questions and service franchise concerns that would not be able to be resolved in such an informal discussion.)

PUC staff from TUS followed up with Met-Ed on the issues raised by the customers that filled out forms and submitted them to Met-Ed at the meeting. Met-Ed provided TUS with a status update on Sept. 21, and TUS will continue to work the issues with Met-Ed.

#### Aug. 8 Met-Ed Customer Workshop in East Stroudsburg

On Aug. 8, Met-Ed held a forum for customers at facilities on the campus of East Stroudsburg University. The forum consisted of various booths staffed with Met-Ed subject matter experts who were available from 3:00 p.m. to 8:00 p.m. to answer customers questions regarding the March storm event. Met-Ed's forum was staffed by Company President Ed Shuttleworth and associated top management staff. Topics included Safety, Reliability, Storm Response Operations, Improvement Projects, Vegetation Management, Communications, and Billing. A member of TUS staff also attended and found the workshop to be educational and well received by the approximately 40 customers that attended.

#### Aug. 9 PA House Majority Policy Committee Hearing<sup>6</sup>

The PA House Majority Policy Committee invited the Commission to testify at a hearing on the March power outages, storm response, and area reliability in general. The hearing was held in the Tobyhanna Township Municipal Building. Vice Chairman Andrew Place testified for the PUC and was joined by PUC TUS, Communications, and Legislative Affairs staff. Also testifying were local officials and emergency responders as well as PPL and Met-Ed. After the invitees testified, some of the main topics discussed included:

- The impact to local businesses of power disruption and the significant costs and opportunity costs that can occur.
- Road closures can be more impactful than service outages in the initial stages of a large-scale event due to the limited number of main roads in the area.
- Local responders and local emergency managers should be brought in the discussion of how roads are prioritized by the County when coordinating road openings with state (PennDOT) and utility partners.
- As in the Stroudsburg Borough meeting, it was discussed as to whether Met-Ed and PPL could explore some tie-ins of facilities to provide power when PPL facilities are energized, and Met-Ed facilities are not.
- The impact of off-right-of-way (ROW) trees on road closures and power outages was discussed; primarily the issue that EDCs require property owner permission to remove danger trees outside the ROW.
- It was also noted that Met-Ed and PPL should continue their reliability improvement work in the Pocono region due to the continuing reliability concerns, especially the vulnerability to severe storms because of the off-ROW trees in such heavily wooded areas.

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<sup>6</sup> An archived video recording of the hearing and the witness testimony can be accessed here: <http://www.pagoppolicy.com/CommitteeHearings2017.aspx>.

## CONCLUSION

Several key findings were made after reviewing the information provided by the EDCs as well as the input gained from the PEMA After-Action Review and other post-storm meetings. The findings are noted below with the recommendations based on those findings in the next section. Overall, utility crews and support workers all performed admirably, under a difficult situation, to restore a large portion of impacted customers in a relatively short period of time. However, some of the findings will need to be acted on as noted in the recommendations.

TUS also highlights the need for the Commission, EDCs, and other stakeholders to consider some long-term weather and climate factors as all stakeholders seek to improve the resiliency of critical infrastructure in Pennsylvania. Resiliency in this context is not just the ability for a utility to withstand impacts from storms and other significant events (e.g., physical and cyber-attacks), but also how the day-to-day operations and reliability will be impacted by the changing climate in Pennsylvania. As noted in the recently released *Fourth National Climate Assessment*, the northeastern U.S. will likely become warmer and wetter.<sup>7</sup> A recent report issued by insurance broker Aon noted that in 2018 the world experienced 39 weather disasters that cost over a billion dollars each. The report also detailed that the U.S. had the most billion-dollar weather disasters in 2018, with 16. Winter storm Riley made the list for the northeast at an estimated \$2.3 billion in economic losses.<sup>8</sup> TUS believes attention should be paid to climate impacts as EDCs plan their capital improvements and continue their required inspection and maintenance programs.<sup>9</sup> All of the large EDCs have Long-Term Infrastructure Improvement Plans (LTIPs) and TUS suggests EDCs consider storm hardening and climate adaptation as programs to be addressed through modified or future LTIPs.<sup>10</sup>

TUS also reviewed the Florida Public Service Commission's (PSC) *Review of Florida's Electric Utility Hurricane Preparedness and Restoration Activities 2018* report.<sup>11</sup> While Florida has a very different climate and faces unique threats such as direct hits from hurricanes, some of the key findings in the PSC report are similar to storm-related challenges faced in Pennsylvania. The Florida PSC recognized the challenges presented by off-right-of-way (ROW) trees and the limitations on the utilities' ability to address those off-ROW trees. The PSC also noted inaccurate restoration estimates, which is a continuing challenge for Pennsylvania EDCs in large-scale events such as Riley. Florida also requires its investor-owned EDCs to file storm hardening plans for review every 3 years.<sup>12</sup>

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<sup>7</sup> The *Fourth National Climate Assessment* may be found here: <https://nca2018.globalchange.gov/>. Chapter 18 contains specific information on the northeast U.S., see here: <https://nca2018.globalchange.gov/chapter/18/>. See also the International Panel on Climate Change's *Special Report on Global Warming of 1.5°C*, available at: <https://www.ipcc.ch/sr15/>.

<sup>8</sup> The Aon report is available here: <http://thoughtleadership.aonbenfield.com/Documents/20190122-ab-if-annual-weather-climate-report-2018.pdf>.

<sup>9</sup> Inspection and maintenance standards for EDCs are codified at 52 Pa. Code § 57.198. See here: <https://www.pacode.com/secure/data/052/chapter57/s57.198.html>.

<sup>10</sup> See 52 Pa. Code § 121.

<sup>11</sup> The Florida PSC report is available here: <http://www.floridapsc.com/Files/PDF/Publications/Reports/Electricgas/UtilityHurricanePreparednessRestorationActions2018.pdf>.

<sup>12</sup> <https://www.flrules.org/gateway/RuleNo.asp?title=ELECTRIC%20SERVICE%20BY%20ELECTRIC%20PUBLIC%20UTILITIES&ID=25-6.0342>.

The findings note that off-ROW trees appeared to be the leading cause of the outages. The Commission's report, *Electric Service Reliability in Pennsylvania 2017*, which is prepared by TUS, noted the issue of off-ROW trees and its impact on electric reliability.<sup>13</sup> Some of the same recommendations in that report are repeated here.

## **I. Findings**

### **• All EDCs**

- The affected EDCs successfully used social and traditional media to communicate with customers before and during the ice storm.
- In general, the EDCs worked effectively with elected officials, county emergency management, and local emergency management.
- The forecast uncertainty and geographic scope of the projected impacts of Riley appeared to have impacted the ability of the EDCs to bring in the desired number of mutual aid resources before the storm hit.
- EDC daily informational conference calls with state and local elected officials and local emergency management continued to be well received.
- The staffing of county 911 centers and/or emergency operations centers (EOCs) with EDC liaisons during large-scale events is largely beneficial and continues as a best-practice.
- Off-ROW trees appeared to be a primary cause of outages (see Appendix B, Questions 31 and 32).
- The vehicle restrictions on state roads presented challenges to the EDCs as they sought to bring resources in to the base camps utilized for outside mutual aid and contractor resources. EDCs and the PUC were not involved in the vehicle restriction discussions and the PUC was asked by the EDCs to request waivers for utility and contractor vehicles.
- EDCs may have issues with county emergency managers where the EDCs have not met in the past year with county emergency management to discuss response and restoration expectations.
- In certain circumstances, especially in areas with limited highway options, county emergency management may want the EDCs to prioritize road closures involving downed wires over restoration of critical infrastructure.
- No EDC appeared to have any issues with their ability to handle high customer call volumes.

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<sup>13</sup> The *Electric Service Reliability in Pennsylvania 2017* report is available here: [http://www.puc.pa.gov/General/publications\\_reports/pdf/Electric\\_Service\\_Reliability2017.pdf](http://www.puc.pa.gov/General/publications_reports/pdf/Electric_Service_Reliability2017.pdf).

- **Met-Ed**

- Met-Ed did not begin its damage assessment process until March 5, 2018, and concluded on March 11. This is two days later than PECO and three days later than all of the other EDCs (see Appendix B, Question 30).
- Met-Ed indicated that work was required on backbone feeders and substations in the Monroe and Pike County areas, and this led to a smaller number of job orders on March 2 and 3 (see Appendix B, Question 28).
- TUS, in the March 8 conference call with Met-Ed, indicated that Met-Ed should be working in the quarantined areas to assess damage to underlying infrastructure in order to have faster restoration when the feeder lines were restored.
- It appears that the delay in Met-Ed's initiating its damage assessment process contributed to a longer duration of outages, especially in the Monroe and Pike County areas.
- It appears that local, county, and state officials would benefit from periodic updates on the progress of Met-Ed's reliability improvement work in Monroe and Pike Counties as these efforts may improve storm response and resiliency.
- It may be beneficial for Met-Ed and PPL to discuss potential engineering solutions related to improving reliability and possible tie-ins for common areas where the two EDCs operate.
- It appears that Met-Ed could have alleviated some of the concerns in regard to its restoration efforts if it more effectively communicated its restoration strategy to the public and local and state officials during its elected official calls and through the media and its webpage, especially for those areas most impacted. It appears that accurate ETRs were challenging for Met-Ed in certain areas, and changing ETRs appeared to be a frustration for customers and state and local officials.

- **PECO**

- PECO appeared to have effective communications with customers and local and state elected officials.
- PECO was able to react to and restore quickly the additional outages caused by Quinn.
- PECO appeared to manage its county liaison and road closure process effectively.

- **PPL**

- PPL appeared to have effective communications with customers and local and state elected officials.
- PPL appeared to manage its county liaison and road closure process effectively.

- It appears that local, county, and state officials would benefit from periodic updates on the progress of PPL’s reliability improvement work completed in Pike and Monroe Counties as these efforts may improve storm response and resiliency.
- **PCLP**
  - PCLP appeared to have effective communications with local and county officials.
- **Penelec**
  - Penelec was able to quickly recover from Riley and provide mutual aid support for other EDCs.

## II. TUS Recommendations

Note: Recommendations are followed up in parenthesis with current status update or comments.

- **Recommendation 1:** EDCs should continue their cooperation and communication with county 911 centers and emergency management agencies (EMA) and continue to offer liaisons for expected major service outage events.  
  
(TUS will work with the EDC storm response best practice working group on this issue.)
- **Recommendation 2:** EDCs should meet with each county in their service territories at least annually to review emergency procedures and expectations for responses, road closures, and the EDC liaison processes.  
  
(TUS will work with the EDCs to ensure this occurs.)
- **Recommendation 3:** During significant weather events that may cause utility infrastructure to be involved in road closures, EDCs should work with county emergency management to ensure consensus on the priority of work in addressing public safety, which may be opening priority roads before addressing priority restoration. This may be discussed in the meetings outlined in Recommendation 2, above.  
  
(TUS will work with the EDC storm response best practice working group on this issue.)
- **Recommendation 4:** EDCs should continue to collaborate on a best practice for managing ETRs, especially during major service outage events.  
  
(The EDC storm response best practice working group continues to work on this issue.)
- **Recommendation 5:** An informal reliability investigation of Met-Ed should be initiated for Met-Ed’s delay in initiating its damage assessment process and in particular the damage assessment process for the quarantined circuits in Monroe and Pike Counties. Alternatively, the matter may be referred to the Bureau of Investigation and Enforcement for such actions as it deems necessary.  
  
(TUS will work with Law Bureau and the Commissioners’ Offices on the recommended action.)

- **Recommendation 6:** The PUC suggests that it may be beneficial to hold a coordinating discussion with ESF 1 primary and support agencies on the subject of closure and/or restrictions of certain vehicles on state roads during weather events, including a discussion of parameters of potential waivers, including hours of service waivers.

(TUS will follow up with the ESF 1 primary and support agencies on this recommendation.)

- **Recommendation 7:** While outside the jurisdiction of the Commission, TUS recommends EDCs consider approaching the Pennsylvania Legislature for possible relief that will grant utility companies the authority to remove or trim danger trees that are off their existing ROW. Such relief could be the ability to establish a wider ROW or allow utilities the authority to trim or remove trees that can potentially fall onto power conductors

(TUS will work with the EDCs on this suggestion.)

- **Recommendation 8:** EDCs should work with local and county authorities on proactive measures to identify and remove off-ROW danger trees that can fall in to roads. EDCs should also work with those same entities on ensuring the proper species of trees are planted within 60 feet of primary electrical conductors.

(TUS will follow-up with the EDCs and the Energy Association of Pennsylvania on this suggestion.)

- **Recommendation 9:** EDCs should consult with experts on climate, in particular the climate of Pennsylvania and the northeast, in order to understand the expected and/or potential impacts to utility infrastructure due to ongoing and projected climate changes.

(TUS will task the EDC storm response best practice group with working on this issue.)

- **Recommendation 10:** EDCs should consider storm hardening and climate adaptation as programs to be addressed through modified or future LTIPs, especially as informed by information gleaned from Recommendation 9, above.

(TUS will work with EDCs on this issue.)

- **Recommendation 11:** EDCs that do not currently have LTIPs, such as PCLP, should consider the potential benefits to having an LTIP and DSIC as means to improve resiliency and reliability.

(TUS will work with EDCs on this issue.)

- **Recommendation 12:** TUS will incorporate the following practices for future emergency events:
  - PUC AREPs will ask EDCs to report the counties that the EDCs have active liaisons deployed with in the EDC outage reports;
  - After 24 hours have passed from the onset of a weather disaster, PUC AREPs will poll the applicable PEMA Regional Offices for any coordination issues that impacted counties may be having with jurisdictional utilities;

- TUS will request the EDCs' storm damage model predictions before potential high-impact events, such as Riley (see Appendix B, Question 37); and
- TUS will request a summary of the lessons learned from each EDC in regard to the EDCs' after action reviews (see Appendix B, Question 36).

(TUS will add the items to its standard operating procedures for AREPs and for Storm Response.)

**APPENDIX A**  
**KEY INFORMATION REPORTED ON THE REPORT OF OUTAGE**  
**FORMS BY EDCS**

**Summary of EDC Outage Data**

Below is a summary of Winter Storms Riley and Quinn statistical information provided by the EDCs. Some Sandy and Nika statistics are included for comparison. Some of the EDCs were not impacted by Winter Storm Quinn.

- Number of customers affected and as a percentage of total customers:

	<b>Customers Affected Storms Riley and Quinn 2018</b>	<b>% of Total Customers</b>	<b>Customers Affected Nika 2014</b>	<b>% of Total Customers Nika 2014</b>	<b>Customers Affected Sandy 2012</b>	<b>% of Total Customers Sandy 2012</b>
<b>Met -Ed</b>	272,928	49.22%	144,000	26.00%	298,300	54.00%
<b>PECO</b>	794,969	46.76%	723,681	42.00%	845,703	54.20%
<b>Penelec</b>	90,856	15.61%	N/A	N/A	96,847	16.40%
<b>PCLP</b>	2,101	47.44%	N/A	N/A	4,487	100.00%
<b>PPL</b>	261,341	18.67%	92,283	7.00%	523,936	37.50%
<b>Total</b>	1,422,195		959,964		1,769,273	

- Date and time of first information of a service outage (time is 24-hour format):

	<b>Date of First Outage</b>	<b>Time of First Outage</b>
<b>Met-Ed</b>	3/2/2018	6:00
<b>PECO</b>	3/2/2018	6:59
<b>Penelec</b>	3/1/2018	18:30
<b>PCLP</b>	3/2/2018	10:47
<b>PPL</b>	3/2/2018	1:45

- Date and time that service was restored to the last affected customer (time is 24-hour format):

	Date of Final Restoration	Time of Final Restoration	Quinn and Riley Duration (Days)	Sandy 2012 Duration (Days)	Nika Duration (Days)
<b>Met-Ed</b>	3/11/2018	20:15	9.6	10	4.8
<b>PECO</b>	3/10/2018	14:18	8.3	9	7.6
<b>Penelec</b>	3/5/2018	19:50	4	5	*
<b>PCLP</b>	3/13/2018	11:10	11	11	*
<b>PPL</b>	3/10/2018	2:45	8	9	3.8

\*Pike County and Penelec were not seriously impacted by Winter Storm Nika

- Outages six or more hours in duration:

	Riley and Quinn 2018 ≥ 6 Hour Outage Cases	Riley and Quinn 2018 Total Outage Cases	Sandy 2012 ≥ 6 Hour Outage Cases	Sandy 2012 Total Outage Cases	Nika 2014 ≥ 6 Hour Outage Cases	Nika 2014 Total Outage Cases
<b>Met-Ed</b>	1,804	2,356	2,422	2,473	1,729	1,756
<b>PECO</b>	4,922	5,267	4,674	4,540	6,047	8,915
<b>Penelec</b>	592	1,028	814	1,006	*	*
<b>PCLP</b>	21	318	6	6	*	*
<b>PPL</b>	2,174	2,801	2,948	3,819	610	841
<b>Total</b>	9,513	11,770	10,864	11,844	8,386	11,512

\*Pike County and Penelec were not seriously impacted by Winter Storm Nika

- Rank of Riley & Quinn compared to a comparable storm event:

	Riley and Quinn Rank	Riley and Quinn Outages	Riley and Quinn Duration (Days)	Sandy Rank	Sandy Outages	Sandy Duration (Days)
<b>Met-Ed</b>	2	272,928	9	1	298,300	10
<b>PECO</b>	3	794,969	8	1	845,703	9
<b>Penelec</b>	6	90,856	4	3	96,847	5
<b>PCLP</b>	Below Top 3	2,101	11	1	4,487	11
<b>PPL</b>	9	261,341	8	1	523,936	9

- Description of physical damage to utility infrastructure:

<b>Riley and Quinn 2018</b>					
	<b>Poles Replaced</b>	<b>Transformers Replaced</b>	<b>Miles/Spans of Wire</b>	<b>Crossarms Replaced</b>	<b>Fuses/Cutouts</b>
<b>Met-Ed</b>	573	242	40.4 (mi)	1,351	1,122
<b>PECO</b>	183	156	56 (mi)	996	5,642
<b>Penelec</b>	68	24	6.2 (mi)	172	124
<b>PCLP</b>	*	*	*	*	*
<b>PPL</b>	158	352	66.5 (mi)	303	839
<b>Totals</b>	982	774	169.1	2,822	6,888
*Pike County did not report this information in detail.					
<b>Nika 2014</b>					
	<b>Poles Replaced</b>	<b>Transformers Replaced</b>	<b>Miles/Spans of Wire</b>	<b>Crossarms Replaced</b>	<b>Fuses/Cutouts</b>
<b>Met-Ed</b>	174	115	31 (mi)	2,530	3,400
<b>PECO</b>	520	307	100 (mi)	2,559	14,554
<b>Penelec</b>	*	*	*	*	*
<b>PCLP</b>	*	*	*	*	*
<b>PPL</b>	53	61	29 (mi)	236	433
<b>Totals</b>	747	483	160	5,325	18,387
*Penelec and Pike County were not seriously impacted by Nika					
<b>Sandy 2012</b>					
	<b>Poles Replaced</b>	<b>Transformers Replaced</b>	<b>Miles/Spans of Wire</b>	<b>Crossarms Replaced</b>	<b>Fuses/Cutouts</b>
<b>Met-Ed</b>	1,040	550	112.7 (mi)	2,530	3,400
<b>PECO</b>	750	398	141 (mi)	2,875	16,522
<b>Penelec</b>	94	87	13.4 (mi)	339	N/A
<b>PCLP</b>	29	17	0	0	N/A
<b>PPL</b>	619	601	76 (mi)	1,494	966
<b>Totals</b>	2,532	1,653	343.1	7,238	20,888
*Fuses/Cutouts not required to be reported at the time					

## **APPENDIX B**

### **SUMMARY OF REQUESTED ADDITIONAL INFORMATION PROVIDED BY EDCS**

The PUC requested that EDCs provide additional information and answer questions regarding storm preparation and storm response to Riley and Quinn. The following questions and EDC responses are summarized below and focus specifically on: storm preparation, media use, call center performance, restoration messaging, and personnel resource management. The questions will be listed in order followed by a brief summary of the individual EDC response.

#### **Preparation**

**QUESTION 1.** Describe how your utility prepared for the storm, including the following: what planning measures were taken and when; what pre-deployment of assets occurred and specifically when and where; and what type of outside resources (personnel or equipment) were requested and received and when.

#### **Met-Ed**

After receiving the first weather forecast on Feb. 28, 2018, Met-Ed began storm preparations and initiated the first storm call on March 1, 2018 at 11:00 a.m. Met-Ed began staffing its Customer Operations Centers with line, substation, forestry, and fleet personnel on March 1 to prepare for the anticipated impact beginning overnight between March 1 and March 2, 2018.

Met-Ed continued making preparations and planning logistics, which included:

- Defining key daily safety messages for the physical workforce based on the magnitude of the predicted event
- Reviewing weather forecasts and assessing anticipated geographical impacts
- Reviewing available resources and establishing resource needs by location
- Reviewing, establishing, and initiating external communications with governmental and community contacts
- Reviewing Customer Contact Center staffing and messaging plans
- Establishing a tentative critical customer communications plan
- Initiating hospitality securing lodging for external resources

On Feb. 28, 2018, Met-Ed requested 160-line full time equivalent (FTEs) resources and on March 2, 2018 requested an additional 400-line FTEs and 200 damage assessor FTEs. Met-Ed received a total of 604-line workers and 220 damage accessors/hazard responders over the course of March 2 to March 8, 2018.

## **PECO**

On March 1, 2018, at 09:00 a.m., PECO held a pre-event conference call to prepare for Storm Riley. PECO finalized arrangements and activation of all storm centers, in addition to making field resources available to work the storm response for the Operation Control Center (OCC). All storm centers were opened on March 2, 2018, at 08:00 a.m., including PECO's Emergency Operations Center (EOC), Distribution System Operations, and all Regions Storm Centers. PECO's EOC remained open until March 11, 2018, at 11:00 p.m. The field and back office staffing remained fully active without any break in restoration from Riley to Quinn.

PECO did not relocate regional field resources, due to the smaller "in reach" size of PECO's service territory in relation to the location of its existing service buildings. PECO was within reach to respond and adjust resources to locations as needed. Supply locations in the region activated additional staff, and prepared storm kits and replacement materials and equipment.

On March 1, 2018, PECO contacted all Contractors of Choice to ensure resource availability numbers. PECO's affiliate Exelon Utilities was contacted for available resources as well. Another affiliate, ComEd, provided contractor and utility company resources to PECO in anticipation of the storm impact.

Foreign Crews were requested from the following Regional Mutual Assistance Groups (RMAGs): North Atlantic Mutual Assistance Group (NAMAG) and Southern Electric Exchange (SEE), with conference calls being held starting on March 1, 2018. Due to weather complications and resources already dedicated to Puerto Rico, many resources could not be mobilized until March 2, 2018, at 07:30 p.m. In total, 2,877 full time employees were acquired for the storms. Leading up to Quinn, PECO focused on public safety, health, schools, and road openings, and continued to hire additional contractors.

## **Penelec**

Penelec began storm preparations as soon it received the weather forecast on February 28, 2018. All Penelec storm leads were placed on alert by the Incident Commander. After receiving an updated forecast on March 1, 2018, operations personnel developed a plan to manage the storm and its damages. FirstEnergy-wide storm calls began on March 1, being held at 10:00 a.m. and 06:00 p.m. On March 1, 2018, at 11:00 a.m., Penelec's storm team calls began in preparation of the weather.

From a research planning perspective, Penelec held troublemen and added linemen to cover the overnight hours of March 1, 2018. It added additional operators to work in the Distribution Control Center (DCC). Beginning at 11:30 p.m. on March 1, 2018, and forestry crews were staged in Erie, Oil City, and Warren. Hazard, DCC, and storm analyst coordinator supervisors were identified. 25 two-man hazard crews were requested, and crews were split between Oil City and Altoona.

Penelec requested 250 additional linemen on Feb. 28, 2018 at 11:15 a.m. Penelec requested that crews be on Penelec property by the end of the day March 1 and be ready by the morning of March 2, 2018. 138 additional linemen arrived on March 1, 2018, due to the limited resource availability from the mutual assistance process. Many member companies did not make resources available early due to the predicted weather impact in their own service territories.

Penelec also requested 50 hazard full time equivalent (FTEs) resources on Feb. 28, 2018 to be ready to work on March 2, 2018, but received only 32 hazard FTEs. 12 were staged in Oil City and ready to respond the morning of March 2. Ten hazard FTEs were staged and ready to respond the morning of March 2. 10 hazard FTEs were staged in Towanda and ready to respond the afternoon of March 2.

### **PCLP**

After hearing of the potential storm development, PCLP contacted ORU, OSMOSE, Nelson Tree, Harlan Electric Construction, Sussex Rural Electric Cooperative (SREC), and Corning Natural Gas Company from Feb. 28, 2018 through March 1, 2018, requesting support. As more information on outages and weather conditions in the western PCLP service area became known, PCLP requested OSMOSE, for damage assessment, to report March 2, 2018, with 8 FTEs; Nelson Tree to report March 2, 2018 with 4 FTEs; ORU for 3 or more FTEs; and Harlan to advance 3 FTEs to arrive on March 4, 2018. PCLP also requested Harlan provide additional line and pole setting crews. In addition, MetroTek Electrical Services (MES) was asked to provide 5 FTEs (qualified linemen) to start March 3, 2018. By March 3, 2018, Nelson increased to 13 FTEs; by March 6, 2018, MetroTek increased to 11 FTEs; and by March 8 and March 11, 2018, Harlan increased to 11 and 16 respectively.

### **PPL**

On Feb. 28, 2018, PPL conducted a system outage modeling based on the weather forecast, notified internal emergency response personnel of the hazardous outlook of the system modeling, cancelled any new time-off requested through the duration of the event, verified internal resources of line, electrical, trouble, and assessors by region, verified contractor line resources and notified contractor leadership to prepare for storm activation, and created damage assessment and restoration strategies per region based on predicted storm impact.

On March 1, 2018, PPL updated the system outage modeling and conducted a pre-storm event planning call with key emergency personnel to discuss predicted outages and staffing strategies. PPL confirmed its February 28, 2018 internal resources of line, electrical, troubleman, and assessors, along with contractor line resources and pre-arranged contractors for storm response on March 2, 2018, to the PPL Regional Command Centers (RCCs). PPL increased its troubleman staffing, staffing at the PPL system operations center, and overnight coverage of customer service representatives for the overnight periods of March 1

and March 2, 2018. Additionally, it began monitoring social media for storm related activity and posted storm preparedness information to the PPL Electric website. PPL prepared plans for housing and feeding accommodations for contractor resources and established a pre-arranged 24-hour staffing for the Company's Emergency Command Center (ECC) and RCCs in each of the Company's six operation regions for March 2, 2018.

The ECC and RCCs were staffed for a March 2, 2018, 07:00 a.m. start, with 250 PPL line personnel, 55 contractor tree crews, and 185 contractor line personnel pre-arranged for storm response on March 2, 2018. Regional operating centers were sufficiently staffed.

As the event continued, PPL requested additional line resources starting on March 2, 2018, at 10:30 a.m.:

- On March 2, 108-line personnel were received.
- On March 3, 64-line personnel were received.
- On March 4, 11-line personnel were received.
- On March 5, 277-line personnel were received.
- On March 6, 213-line personnel were received.
- On March 7, 7 - line personnel were received

On March 3, 2018, PPL created 2 material staging sites with 24-hour staffing near the greatest impacted regions. PPL received 95 contractor assessors on the same day.

**QUESTION 2.** Detail what proactive outreach to special-needs populations occurred and how those messages were disseminated. Provide the dates and times of those outreach efforts.

### **Met-Ed**

On March 1, 2018, FirstEnergy Corporate Communications issued a news release for all FirstEnergy utilities that the Companies were monitoring the possibility of severe weather across the region and that customers should prepare for possible power outages. The news release contained information about how to report an outage and tips for dealing with an outage. The tips apply to all customers, including those with special needs. Additionally, residential customers are notified annually in September of customer service programs, including the Critical Customer Care Program.

### **PECO**

PECO's extensive communication efforts included direct communication through the company's automated phone system, web-based information through their website (peco.com), the company's social media channels (Twitter and Facebook), proactive calls to customers with the most extended outages, and direct communication with essential customers. PECO conducted nearly 150 media interviews to provide

information about the company's preparedness for the storm and to respond to service restoration questions and requests.

PECO prioritized special-needs customers such as schools and nursing homes, making proactive telephone calls to the impacted schools as interruptions were determined. (PECO treats nursing homes as "critical", see PECO's response to Question 3.) PECO created a team specifically focused on restoring power to schools and provided timely restoration information in a proactive manner to customers. This effort and communication were continuous until restoration was confirmed.

### **Penelec**

On March 1, 2018, FirstEnergy Corporate Communications issued a news release for all FirstEnergy utilities that the Companies were monitoring the possibility of power outages due to severe weather across the region. Penelec was included as a utility that could be affected. The news release contained information to customers on how to report an outage and what to do when experiencing an outage. The tips apply to all customers, including those with special needs. Additionally, residential customers are notified annually in September of the availability of customer service programs, including the Critical Customer Care Program.

### **PCLP**

PCLP first notified the public on Thursday, March 1, 2018 on its Facebook page, warning of high wind and heavy snowfall possibly causing electric outages. The page also suggested tips generator usage and preparation for outages. No additional outreach was provided to special-needs populations or critical customers. No outreach or communication was exchanged with county and local emergency management agencies or local and state elected officials.

### **PPL**

Outreach to special-needs populations and critical customers were coordinated through county Emergency Management Agencies (EMAs). PPL did maintain contact with schools for the duration of their outages and proactively provided updates and verified restoration. Specifically, PPL contacted schools it anticipated to remain powerless through Monday March 5 on Sunday, March 4, 2018 at 06:00 p.m. On March 5, PPL contacted schools to provide mobile generators for schools anticipated to be powerless on March 6, 2018.

**QUESTION 3.** Describe any proactive outreach to critical customers (hospitals, nursing homes, water plants, fire/police stations, etc.) and the method of communication. Provide the dates and times of those outreach efforts.

## **Met-Ed**

Met-Ed Customer Support provided regular updates to managed large commercial and industrial customers, including hospitals and schools. The Met-Ed eastern region sent approximately 836 stakeholders' emails throughout the restoration efforts, while the western region sent approximately 1,000 stakeholders' emails. The emails were sent to stakeholders at the following dates and times (24-hour format):

- March 1 at 1207
- March 2 at 1559
- March 2 at 1620
- March 3 at 1050
- March 3 at 1750
- March 4 at 0900
- March 4 at 2105
- March 5 at 0953
- March 5 at 2127
- March 6 at 1120
- March 6 at 2254
- March 7 at 1034
- March 7 at 2033
- March 8 at 1131
- March 8 at 2146
- March 9 at 1143
- March 9 at 2112
- March 10 at 1232

Critical customers that responded to the emails received personal contacts from Met-Ed Customer Support personnel through restoration efforts until their service was restored.

## **PECO**

PECO defines critical customers as hospitals, nursing homes, waste water treatment plants, water pumps, police stations, etc. PECO managed and prioritized these customers throughout the restoration efforts. The company maintains a database of critical customer contacts and each customer was contacted upon their service interruption and was provided with timely restoration information. This contact is continuous until restoration is confirmed; the contact method is primarily by telephone.

## **Penelec**

Penelec proactively sends regular emails to remind critical and assigned customers how to contact Penelec in the event of an emergency or electrical issue. Communication is through group email notifications and personal touch points via phone, in person, or individual emails throughout the year. Outreach specific to this event did not occur.

## **PCLP**

See PCLP's response to Question 2.

## **PPL**

PPL conducted telephonic outreach to nursing homes and other medical facilities on March 2 and March 3, 2018 to provide customer, outage, and safety information. On March 3, 2018, emails were sent to critical customers and communications were monitored for the duration of the event.

The Key Account Manager for the Education sector was active for the duration of Storm Riley. The account manager maintained contact with schools during their outages, proactively providing updates and verifying restoration. Schools that would remain powerless on Monday morning were contacted on Sunday March 4, 2018 at 06:00 p.m. and were contacted to coordinate the provision of mobile generators on March 5, 2018.

**QUESTION 4.** Describe any proactive outreach to county and local emergency management agencies and the method of communication. Provide the dates and times of those outreach efforts.

## **Met-Ed**

Proactive communications regarding expected weather impacts and how to prepare for the weather were made via telephone and email to county commissioners, county emergency management agency (EMA) directors and other key staff, municipal officials, the American Red Cross, federal and state legislators, and state district legislative office staff ("key stakeholders").

On March 1, 2018, between 12:00 and 01:15 p.m., telephone calls were made to EMA directors in Adams, Bucks, Berks, Chester, Cumberland, Dauphin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Pike, and York Counties.

On March 1, 2018, at 01:39 p.m., proactive emails were sent to 348 key stakeholders in Berks, Dauphin, Lancaster, and Lebanon Counties, including parts of Lehigh County as well.

On March 1, 2018, at 04:30 p.m., proactive emails were sent to 320 key stakeholders in Adams, Cumberland, and York Counties.

On March 1, 2018, at 04:30 p.m., proactive emails were sent to 143 key stakeholders in Bucks, Chester, Monroe, Montgomery, Northampton, and Pike Counties, including parts of Lehigh County as well.

### **PECO**

PECO communicated with emergency management agencies prior to and during the storms to keep them informed and to ensure their specific needs were being met, both from a company liaison staffing perspective as well as a road closure process perspective. Outreach began as early as March 1, 2018, and included communication methods such as phone calls, emails, press releases, and daily conference calls.

### **Penelec**

Proactive communications regarding expected weather impacts and how to prepare for the event were made by telephone and email in advance of the weather. Communications were made to county commissioners, county EMA directors and other key staff, municipal officials, federal and state legislators, and state district legislative office staff (key stakeholders).

On March 1, 2018, at 03:06 p.m., proactive emails were sent to 12 key stakeholders in Clarion, Forest, McKean, Venango, and Warren Counties.

On March 1, 2018, at 03:30 p.m., proactive emails were sent to 16 key stakeholders in Armstrong, Cambria, Indiana, Somerset, and Westmoreland Counties.

On March 1, 2018, at 3:44 p.m., proactive emails were sent to 21 key stakeholders in Crawford and Erie Counties.

On March 1, 2018, at 05:16 p.m., proactive emails were sent to 23 key stakeholders in Centre, Clearfield, Elk, and Jefferson Counties.

On March 1, 2018, at 06:20 p.m., proactive emails were sent to 77 key stakeholders in Bradford, Lycoming, Potter, Sullivan, Susquehanna, Tioga, and Wyoming Counties.

On March 1, 2018, at 05:56 p.m., proactive emails were sent to 18 key stakeholders in Blair, Cumberland, Franklin, Huntingdon, Juniata, and Mifflin Counties.

Although it was not ultimately impacted by Quinn, Penelec also sent proactive emails to key stakeholders in Bradford, Lycoming, Potter, Sullivan, Susquehanna, Tioga, Wyoming, and Wayne Counties on March 6, 2018, at 12:12 p.m.

### **PCLP**

See PCLP's response to Question 2.

## **PPL**

PPL's EMA/911 response team contacted or visited EMAs and/or 911 operations centers in Bucks, Lackawanna, Pike, and Wayne Counties, starting on March 2, 2018. Communications were started by phone calls and continued via phone and electronic means throughout the event. Issues discussed included current outage statistics, customer outreach, estimated restoration times, safety considerations, and shelter and warming station updates. PPL representatives were also available on a direct line to streamline and escalate any EMA concerns.

**QUESTION 5.** Describe any proactive outreach to local and state elected officials and how those messages were disseminated. Provide the dates and times of those outreach efforts.

## **Met-Ed**

See Met-Ed's response to Question 4, above, for proactive communications to key stakeholders, including local and state elected officials. Key stakeholders include county commissioners, county emergency management agency directors, municipal officials, the American Red Cross, federal and state legislators, and state district legislative office staff. Met-Ed External Affairs also provided regular updates via email to key stakeholders describing the extent of the outages, the restoration efforts underway, restoration progress, and safety precautions.

Emails were sent to key stakeholders in Berks, Dauphin, Lancaster, and Lebanon Counties, including parts of Lehigh County on the following dates and times (24-hour format):

- March 1 at 1339
- March 2 at 1558
- March 3 at 0940
- March 3 at 1617
- March 3 at 2012
- March 4 at 0807
- March 4 at 2032
- March 5 at 0907
- March 5 at 2018
- March 6 at 1034
- March 6 at 2143
- March 7 at 1035
- March 7 at 2008
- March 8 at 0943

Emails were sent to key stakeholders in Adams, Cumberland, and York Counties on the following dates and times:

- March 1 at 1345
- March 2 at 1554
- March 3 at 0936
- March 3 at 1609
- March 4 at 0803
- March 4 at 2021
- March 5 at 0859
- March 5 at 2023
- March 6 at 1037
- March 6 at 2139
- March 7 at 1019
- March 7 at 2003
- March 8 at 0949

Emails were sent to key stakeholders in Bucks, Chester, Monroe, Montgomery, Northampton, and Pike Counties, along with parts of Lehigh County, on the following dates and times:

- March 1 at 1630
- March 2 at 1530
- March 3 at 1047
- March 3 at 1644
- March 3 at 2051
- March 4 at 2107
- March 5 at 0950
- March 5 at 2019
- March 5 at 2351
- March 6 at 1358
- March 6 at 1437
- March 6 at 2140
- March 7 at 1046
- March 7 at 1223

- March 7 at 2013
- March 8 at 1110
- March 8 at 2044
- March 9 at 0831
- March 9 at 0834
- March 9 at 0848
- March 9 at 0906
- March 9 at 1126
- March 9 at 1326
- March 9 at 1420
- March 9 at 1517
- March 9 at 2039
- March 9 at 2042
- March 10 at 1051
- March 10 at 2048
- March 11 at 2110

## **PECO**

PECO began outreach on March 1, 2018 through communication methods such as phone calls, emails, press releases, and daily conference calls. PECO communicated with local and state elected officials prior to and during the storms to keep them informed of damages and restoration progress and to handle ad hoc issues as they arose.

## **Penelec**

See Penelec Response to Question 4, above, for proactive communications made to key stakeholders, including local and state elected officials. Penelec External Affairs also provided regular updates via email and telephone to key stakeholders describing the extent of the outages, restoration progress, and safety precautions. Penelec also made the following notifications (24-hour format):

- Telephone calls were made to key stakeholders in McKean, Venango, and Warren Counties on March 2, 2018, between 1544 and 1554. These counties were also emailed on March 3, 2018, at 1033.
- Emails were sent to key stakeholders in Centre, Clearfield, Elk, and Jefferson Counties on March 2, 2018. at 1120.

- Emails were sent to key stakeholders in Cambria and Somerset Counties on March 2, 2018 at 1028, 1149, 1721, 1841, 1940, and 2012.
- Emails were sent to key stakeholders in Erie and Crawford Counties on March 2, 2018. at 0839 and 1718.
- Emails were sent to key stakeholders in Bradford, Lycoming, Sullivan, Susquehanna, Wyoming, and Wayne Counties on March 2, 2018. at 1302, 1338, 1844, 1935, and 1946; on March 3, 2018 at 1236, 1250, 1816, and 1821; and on March 4, 2018. at 1252 and 1257.
- Emails were sent to key stakeholders in Lycoming, Sullivan, Susquehanna, Wyoming, and Wayne Counties on March 5, 2018. at 0843, 0901, and 1347.

### **PCLP**

See PCLP's response to Question 2.

### **PPL**

PPL held conference calls for elected officials in the Lehigh and Northeast regions of PPL service territory where the company's storm response, estimated restoration times (once they were available), and storm issues were discussed. Calls were held on March 3, 4, 5, 6, and 7 at 04:00 p.m.

Email updates were also sent to elected officials in the Harrisburg, Lancaster, Susquehanna, and Central regions of PPL service territory on March 3, 4, 5, 6, and 7 at 04:00 p.m.

PPL staff were in contact with state legislators, their staff, and municipal officials throughout the event to address specific local concerns.

**QUESTION 6.** Describe any proactive outreach to local and state elected officials and how those messages were disseminated. Provide the dates and times of those outreach efforts.

### **Met-Ed**

See Met-Ed response to Question 5.

### **PECO**

See PECO response to Question 5.

### **Penelec**

See Penelec response to Question 5.

## **Pike County**

See Pike County response to Question 2.

## **PPL**

See PPL response to Question 5.

**QUESTION 7.** Describe how your utility utilized both traditional (print/radio/TV) media and social media (Twitter/Facebook/Texts/Website) before the storm and throughout the restoration process for both the March 1-2 and March 7 storms.

## **Met-Ed**

Met-Ed used a mix of traditional and social media to communicate before and during the March storms as part of its overall communications outreach. This outreach included news releases and media interviews (see Met-Ed response to Question 9), radio spots urging customers to prepare for power outages caused by winter weather, social media channels (including Twitter and Facebook), website updates and text messages to customers who had previously signed up for that service.

In traditional media, Met-Ed was mentioned in a FirstEnergy Corporate Communicates news release sent out in advance of the severe weather forecasted to impact the region. See Met-Ed response to Question 2. Once the weather hit, Met-Ed distributed a series of daily news releases to the media to provide status updates of power restoration in the Met-Ed service area, focusing on estimated restoration times and additional resources Met-Ed was able to secure through the mutual assistance process.

Met-Ed's Twitter (@Met\_Ed) and Facebook ([www.facebook.com/MetEdElectric](http://www.facebook.com/MetEdElectric)) accounts posted reminders to customers on how to prepare for potential outages and report those outages and provided outage safety tips. These accounts offered a platform for Met-Ed to share information about their restoration process and to provide live outage updates such as estimated restoration times to customers and the public. The questions and feedback from customers during the storm helped generate and circulate information that more directly addressed customer concerns and issues.

Met-Ed active a "Storm Information" banner at the top of the 24/7 Power Center Pennsylvania dedicated storm information page. Updates were provided at least daily on restoration efforts, news releases, water and ice distribution locations, safety reminders, the power restoration process, communication resources, and other information to help customers manage an outage.

Customers could also utilize the text messaging service to report outages or request status updates on the restoration progress and estimated restoration times.

## **PECO**

PECO used a mix of traditional and social media to keep customers and the public updated on the storm and restoration process.

PECO used traditional media (print/radio/TV) to inform customers, government leaders, and key stakeholders about customer outages. This information, distributed through news releases and on-camera and phone interviews, communicated insights on the causes of outages, outage reporting, restoration efforts, and customer safety.

Using Twitter and Facebook, PECO informed customers, government leaders, and key stakeholders of restoration efforts and customer safety during the storm. This included proactive posts, as well as posts responding to customer questions about safety, emergencies, and outages.

On [peco.com](http://peco.com), PECO activated the storm banner portion of the company's website and locked the homepage screen to "Storm Restoration" when the storm impacted the region. The storm restoration page directs users to the storm center section of the website, which links to additional storm-related sections of the website: Outage Map, Storm Readiness, Storm Restoration Process, and Preventing Outages.

PECO also issued individual texts through its Customer Preference Center. These texts went to customers who opted to receive updates through this channel, specifically for outage reporting, Estimated Restoration Times (ETRs), and power restoration alerts.

## **Penelec**

As part of its overall communications outreach, Penelec used a mix of traditional media and social media to communicate before and during the March storms. This outreach included news releases and media interviews (See Penelec response to Question 9), radio spots urging customers to prepare for power outages, social media channels (including Twitter and Facebook), website updates and text messages to customers who previously signed up for that service.

In traditional media, Penelec was mentioned as part of a news release distributed by FirstEnergy Corporate Communications in advance of the severe weather forecasted to impact the region. See Penelec response to Question 2. The outage activity did not dictate additional news releases for Penelec. A few media inquiries were handled over the phone.

Penelec's Twitter (@Penelec) and Facebook ([www.facebook.com/PenelecElectric](http://www.facebook.com/PenelecElectric)) accounts were used to remind customers in advance of the storms how to prepare for potential outages and provide outage safety tips and information on how to report their outages. These accounts created a platform for Penelec to educate customers and the public about their restoration process and to provide live outage updates, such

as restoration times. Customer questions and feedback during the storm helped create and share information that more directly addressed their concerns and issues.

On the Penelec website, customers were able to view a “Storm Information” banner at the top of the 24X7 Power Center Pennsylvania outage maps that directed them to a dedicated storm information page. Updates were provided on Met-Ed’s restoration efforts, safety reminders, the process crews follow to restore power, communication resources, and other information to help customers manage an outage. This link was shared on social media and in news releases and is featured at the top of outage reporting pages across the website.

### **PCLP**

PCLP utilized Facebook, its website [www.pclp.com](http://www.pclp.com) and email to communicate before the storm and throughout the restoration process. Through these means, PCLP provided area locations by street name where damage assessment, tree removal, line construction, and restoration activity took place. These updates were provided between 2 to 4 times per day. Facebook was used throughout the day to communicate and respond to customer inquiries and comments.

### **PPL**

PPL issued 5 news release and participated in more than 50 interviews with print, radio, and TV outlets. PPL also posted social media updates through the event with information on storm preparations, safety measures, and restoration progress. PPL Alerts system sent notifications about outages and estimated restoration times to customers via the method of their choice (phone, text, and/or email). The estimated restoration times were available on the PPL web-based outage map.

**QUESTION 8.** Document any earned media coverage and provide any instances of media buys, if any.

### **Met-Ed**

In addition to media coverage through interviews or news releases, Met-Ed ran radio spots urging customers to be prepared in the event the winter storms caused power outages. The ads aired on the following radio stations in the Met-Ed service area from March 1, 2018, at 03:00 p.m. to March 3, 2018, at 12:00 p.m.:

- York-WGTY
- Harrisburg-WHP (AM)
- Reading-WEEU (AM)
- Lebanon-WLRB/WQIC
- Easton/Stroudsburg-WWYY/WODE

The radio spot is transcribed as follows:

*The following is a public service message from Met-Ed: Severe storms are forecasted for our area and may cause power outages. Make sure you're prepared with extra batteries for flashlights and radios, bottled water, blankets, and car chargers to power your cell phones. To stay in touch, you can access current power information online anytime day or night. For storm preparation tips and updates during and after a storm visit our 24/7 power center using any mobile device at meted.com, or follow us on Twitter or Facebook. If your power does go out, please report your outage by calling us toll-free at 1-888-LIGHTS. That's 1-888-544-4877. Please take a minute to save this number in your cell phone. Your calls help us pinpoint affected areas, so we can work to restore power as quickly as possible. Get the latest storm and outage information at met-ed.com.*

Met-Ed also ran a newspaper ad following the restoration effort to thank customers for their patience and to provide the scope and scale of work that was done. The ad ran in the following newspapers on March 14, 2018:

- Easton Express Times-PA Zone
- York Dispatch and Daily Record
- Gettysburg Times
- Harrisburg Patriot News<sup>14</sup>
- Reading Eagle
- Pottstown Mercury
- Allentown Daily Call
- Doylestown Intelligencer

The newspaper ad is transcribed as follows:

*Nearly 250,000 of our customers were affected by the two Nor'easters that slammed into our service area earlier this month.*

*Met-Ed responded with a small army of utility personnel-more than 2,300 line workers, hazard responders and assessors, forestry crews, job dispatchers, and electrical contractors. Our team worked around the clock under very difficult conditions to restore power as quickly and safely as possible, mobilizing at more than 6,200 locations to replace approximately 1,300 crossarms, 570 poles, 250 transformers, and 40 miles of wire and cable.*

*Simply put, it quickly became one of the largest restoration efforts in our company's history.*

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<sup>14</sup> Newspaper Ad ran on March 15, 2018 as the paper is not published on Wednesdays.

*We'd like to thank the crews from other utilities who helped us along the way. We also extend a special thanks to the police, fire, and emergency management officials who worked side-by-side with us to keep public safety a priority and meet the unprecedented challenges created by these storms.*

*But most of all, we'd like to thank our customers for your support, and for looking out for one another during this crisis. We know it's frustrating to be without power for an extended period-we live and work here too. So we appreciate your sense of community as we weathered the storm, together.*

## **PECO**

PECO conducted nearly 150 media interviews (print/TV/radio) during the storms. From March 2, 2018 to March 10, 2018, PECO was interviewed by ABC6, AP, Bucks County Courier Times, CBS National, CBS Radio, CBS3, Delco Times, FOX, FOX 43 Harrisburg/York, Inquirer, Intelligencer, KYW, Levittown.com, NBC10, News Journal, NPR, Philadelphia Tribune, PHL17, Pottstown Mercury, Reading Eagle, Telemundo, United States Traffic Network, WCB Radio, WCHE, Weather Channel, WGAL, WHYY, WNPN Lansdale, and WNPV.

PECO was mentioned in 378 articles regarding Nor'easter storms between March 1 and March 12, 2018. These mentions cumulatively garnered 1,489,224,335 potential impressions and received 12,325 shares on Facebook and 5,915 shares on Twitter.

PECO completed media buys with several outlets, including print, out of home, digital, and social media. The advertisements thanked customers for weathering the storm with PECO. These advertisements were present at various times throughout March 12 to March 21, 2018.

## **Penelec**

In addition to news releases and interviews, Penelec ran radio spots urging customers to prepare for power outages. The ads aired on the following radio stations in the Penelec service area from March 1 at 03:00 p.m. to March 3, 2018 at 12:00 p.m.:

- Altoona-WFGY, WALY
- Johnstown-WKYE
- Erie-WXKC, WXTA
- Towanda-WHGL

The radio ad is transcribed as follows:

*The following is a public service message from Penelec: Severe storms are forecasted for our area and may cause power outages. Make sure you're prepared with extra batteries for flashlights and radios,*

*bottled water, blankets, and car chargers to power your cell phones. To stay in touch, you can access current power information online anytime day or night. For storm preparation tips and updates during and after a storm visit our 24/7 power center using any mobile device at [penelec.com](http://penelec.com) or follow us on Twitter or Facebook. If your power does go out, please report your outage by calling us toll-free at 1-888-LIGHTS. That's 1-888-544-4877. Please take a minute to save this number in your cell phone. Your calls help us pinpoint affected areas, so we can work to restore power as quickly as possible. Get the latest storm and outage information at [penelec.com](http://penelec.com).*

## **PCLP**

PCLP did not run any additional media buys during the storm, but its Facebook page posts were shared on various Municipality Pages, including Pike County Dispatch, Milford Road, PortJervisNY.com, and various Housewives Group pages.

## **PPL**

On March 3, PPL paid to boost a Facebook post that contained its first announcement of regional ETRs. On March 4, PPL promoted a post that explained its policy for customer reimbursement of ice and water.

**QUESTION 9.** Provide the dates and times that media releases and/or media interviews occurred, and the subject matter.

## **Met-Ed**

The following is a list of news releases that were issued, via PR Newswire on the following dates and times (24-hour format):

- FirstEnergy Storm Preparation-March 1, 2018, at 1354 (See Met-Ed Response to Question 2)
- Met-Ed Service Restoration Update-March 4, 2018, at 1916
- Met-Ed Service Restoration Update-March 5, 2018, at 1911
- Met-Ed Service Restoration Update-March 6, 2018, at 1346
- Met-Ed Service Restoration Update-March 7, 2018, at 1248
- Met-Ed Service Restoration Update-March 8, 2018, at 1143
- Met-Ed Service Restoration Update-March 9, 2018, at 1104

In addition, media interviews occurred with print, radio, and tv news outlets in the affected areas (24-hour format):

- On March 2, 2018: WLBR Radio, Lebanon at 0700; topics included storm preparations and damage/restoration to date.

- On March 2, 2018: WGAL TV 8, Lancaster/York at 1600; Pocono Record, Howard Frank at 0945; Express Times, Steve Novak at 1030; WEEU, Len Carmen at 1115; Ch. 6-TV, Walter Perez at 1200; Fox 56, Katie Berlin at 1230; Reading Eagle at 1530; and 69 News, Andrew McKeenan at 1615; topics included storm damage and restoration.
- On March 6, 2018: Fox 56 News, Wilks Barre from 1200-1430; an interview at Met-Ed's Saylorsburg staging site, topics included restoration process and progress.
- On March 6, 2018: Pocono Record at 1500; Blue Ridge Communications cable TV at 1830; and Blue Ridge Communications cable TV at 2100; topics included storm damage and restoration.
- On March 7, 2018: WGAL TV 8, Lancaster/York at 0830; Reading Eagle at 1000; Easton Express Times at 1030; Pocono Record at 1100; Blue Ridge Communications cable TV at 1300; WABT Radio 96.7 at 1315; Blue Ridge Communications cable TV at 1545; Fox 56 News, Wilkes Barre at 1620; Blue Ridge Communication's cable TV at 1915; Fox 56 News, Wilkes Barre at 2100; and Fox 56 News, Wilkes Barre at 2215; topics included storm damage and restoration.
- On March 8, 2018: Blue Ridge Communications cable TV, interview at Stroudsburg Met-Ed office at 0900; topics included storm damage and restoration.
- On March 8, 2018: Pocono Record at 1000; WABT Radio 96.7 at 1030; Blue Ridge Communications cable TV at 1130; Blue Ridge Communications cable TV at 1650; Fox 56 News, Wilkes Barre at 1730; and Fox 56, Wilkes Barre at 2200; topics included storm damage and restoration.
- On March 9, 2018: Pocono Record at 0915; Blue Ridge Communications cable TV at 1330; Fox 56 News, Wilkes Barre at 1800; and Fox 56 News, Wilkes Barre at 2145; topics included storm damage and restoration.
- On March 10, 2018: Pocono Record at 0930; Blue Ridge Communications cable TV at 1100; and Fox 56 News, Wilkes Barre at 1420; topics included restoration update.

## **PECO**

News releases were distributed on March 3, 2018 and March 11, 2018. PECO was interviewed by ABC6, AP, Bucks County Courier Times, CBS National, CBS Radio, CBS3, Delco Times, FOX, FOX 43 Harrisburg/York, Inquirer, Intelligencer, KYW, Levittown.com, NBC10, News Journal, NPR, Philadelphia Tribune, PHL17, Pottstown Mercury, Reading Eagle, Telemundo, United States Traffic Network, WCB Radio, WCHE, Weather Channel, WGAL, WHYY, WNPB Lansdale, and WNPV.

Topics discussed in interviews included:

- Outages

- Total system impact
- Number of outages remaining
- How customers can report outages
- Causes of outages (e.g., weather conditions, downed trees, etc.)
- System damage overview
- Restoration efforts
  - Number of crews
  - Restoration times (and changing restoration times)
  - Nested outages
- Customer safety
  - Downed power lines, equipment and tree limbs

### **Penelec**

See Penelec response to Question 2 for the FirstEnergy Storm Preparation news release issued via PR Newswire on March 1, 2018 at 01:54 p.m. No additional news releases were issued for Penelec. Media interviews occurred in print within the affected areas on March 2, 2018 (24-hour format):

- Erie Times News, Erie at 1000, 1300, and 1600; topics included storm preparations, storm damage, customers out of service, and restoration.
- Corry Journal, Corry at 1330; topics included storm damage and storm restoration.
- Indiana Gazette, Indiana at 1445; topics included storm damage and storm restoration.

### **PCLP**

PCLP's Facebook page was updated with progress reports on (24-hour format):

- March 1, 2018, with news on the incoming storm and advice about preparing for outages.
- March 2, 2018, at 1152, 1343, and 1718; topics included restoration progress, and estimated time of restoration.
- March 3, 2018, at 1815 and 2236; topics included restoration progress, number of customers without power, and storm damage.
- March 4, 2018, at 1537 and 2023; topics included damage assessment, restoration progress, and estimated time of restoration.
- March 5, 2018, at 1411 and 1804; topics included damage assessment, restoration progress, and estimated times of restoration.
- March 6, 2018, at 0809, 0818, 0836, 0906, 1338, and 2052; topics included safety tips, restoration progress, and warning of incoming Quinn.
- March 7, 2018, at 1119 and 1424; topics included storm damage and restoration progress.

- March 8, 2018, at 0821, 0850, and 1916; topics included storm damage, restoration progress, and estimated times of restoration.
- March 9, 2018, at 0820 and 2044; topics included restoration progress and estimated times of restoration.
- March 10, 2018, at 1821, 1948, and 2048; topics included restoration progress and estimated times of restoration.
- March 11, 2018, at 1845; topics included restoration progress and estimated times of restoration.
- March 14, 2018, at 0805 and 1705; topics included restoration progress.
- March 15, 2018, at 1244; topics included preferred form of contact and notifications from PCLP.

## **PPL**

Media releases including information on restoration progress and expectations, PPL's use of mutual assistance to expand restoration work, and safety tips were released on (24-hour format):

- March 2 at 1605, March 3 at 1520, March 4 at 1100, March 5 at 1240, and March 6 at 1330.

PPL representatives conducted more than 50 media interviews, generally focused on storm impact and restoration progress. Some interviews leading up to the March 7 storm also focus on the potential impact of Storm Quinn.

- On March 1, there were two television interviews.
- On March 2, there were eight newspaper, four television, and one radio interviews.
- On March 3, there were six newspaper and one television interviews.
- On March 4, there were three television and two newspaper interviews.
- On March 5, there were 10 television, four newspaper, and one radio interviews.
- On March 6, there were six television, three newspaper, and one radio interviews.
- On March 7, there were two television, one radio, and one newspaper interviews.
- On March 8, there were one television and one newspaper interviews.

**QUESTION 10.** Describe how your utility utilized social media-direct response to customer Tweets or Facebook posts, Facebook and Twitter updates, updated messaging on outage websites, etc.

## **Met-Ed**

Met-Ed posted at least two detailed storm updates each day, which detailed the number of customers restored and out of service, hardest-hit damage locations, water and ice distributors, and updated ETRs. Several daily safety reminders about downed power lines and generators were also posted, as well as shared local organizations' posts about local shelters and warming stations.

Met-Ed responded to hundreds of customers who had downed power lines on their property, questions about outage communication tools, or general outage information. Photos and videos of tree and equipment damage were also posted to help customers understand why repairs were time consuming.

In total, Met-Ed published 439 storm and restoration-related posts to its Twitter and Facebook accounts between March 2 and March 11, 2018. These accounts can be found at [www.twitter.com/met\\_ed](http://www.twitter.com/met_ed) and [www.facebook.com/MetEdElectric](http://www.facebook.com/MetEdElectric).

See Met-Ed response to Question 7 for information regarding messaging on [www.met-ed.com](http://www.met-ed.com).

## **PECO**

PECO's social media team worked 24X7 throughout the storm, with Facebook and Twitter platform updates posted every 4 hours to provide information about outages, restoration efforts, and customer safety. Updates were made more often when additional information became available. This included important safety information, how to report an outage or other emergency, restoration updates, and explanations of nested outages. Updates also provided global ETR and included communication about how and why these times could change as damages were assessed and repaired.

PECO responded to public and private customer inquiries during the storm on Twitter and Facebook. It provided information surrounding emergencies such as gas odors, downed trees, and power lines, and how to immediately report these issues through the PECO emergency hotline. Once the PECO ETR strategy was in place, PECO provided customers with estimated restoration times and pointed customers towards self-service channels (mobile app/website and Emergency Hotline) for keeping up to date on outages and restoration times. For customers submitting photos through Twitter and Facebook, the social media team elevated these issues to the Operations Lead and System Incident Commander to help assess the situation and help guide restoration efforts, and then a response was provided to those customers.

## **Penelec**

More than 92 percent of customers were returned to service within two days following the March 1, 2018 storm, despite the storm causing thousands of outages across Penelec's service area. There was light chatter on social media, and at the height of storm-related outages, detailed updates were posted on Twitter and Facebook explaining the number of customers restored and out of service and including

updated ETRs. Daily safety reminders about downed power lines and generators were also posted. Penelec responded to customers with downed power lines on their property and with questions about outage communication tools. Penelec also provided general information about customer outages as well.

In total, Penelec published 31 storm and restoration related posts on its Twitter and Facebook accounts between March 1 and March 5, 2018. These accounts can be found at [www.twitter.com/penelec](http://www.twitter.com/penelec) and [www.facebook.com/PenelecElectric](http://www.facebook.com/PenelecElectric).

See Penelec response to Question 7 regarding messaging on [www.penelec.com](http://www.penelec.com).

### **PCLP**

See PCLP response to Question 7.

### **PPL**

PPL updated customers and other stakeholders through proactive social media messaging before, during, and after the storm. Facebook, Twitter, and PPL's blog *Stories* ([stories.pplelectric.com](http://stories.pplelectric.com)) were the primary social media outlets used by PPL. The company also used Instagram to share photos of storm restorations and updates for the first time.

Social messaging and graphics detailed ways to prepare for the storm, how to report outages, restoration progress reports, availability of outage alerts for specific alerts, and outage safety information. Messages regarding availability of free ice and water for customers without power for over 24 hours were also posted.

PPL's website contained similar information, with the top area of the website focused exclusively on storm-related photos and updates throughout the event. It contained a link to the *Stories* blog, where storm updates were posted each morning and updated throughout the day. Other storm related tips were posted lower on the website, such as information about the free ice and water process and a reminder for customers to set their outage alert preferences.

24-hour social media monitoring lasted from March 2 to the morning of March 8, 2018. PPL staff responded to customer comments on public posts and private messaging via Facebook; @mentions and direct messaging on Twitter; and comments or questions on the *Stories* blog.

**QUESTION 11.** Provide information on traffic to the company's outage website-both the numbers of unique users and the number of page visits.

**Met-Ed**

From March 2 to March 11, 2018, Met-Ed had 63,305 Pennsylvanian users visit the outage landing page, with 178,556 page views. The page can be accessed at [www.firstenergycorp.com/outages](http://www.firstenergycorp.com/outages).

**PECO**

PECO's outage website had 2,913,168 total page views and 1,060,691 unique views.

**Penelec**

54,175 Pennsylvania unique users visited Penelec's outage landing page between March 1 and March 5, 2018. The page had 129,141 views and can be accessed at [www.firstenergycorp.com/outages](http://www.firstenergycorp.com/outages).

**PCLP**

PCLP did not provide this information.

**PPL**

PPL's outage-related website pages (excluding the outage map) had over 1.5 million page views, with a peak of 100,000 users over the time frame of March 1 to March 12, 2018. During the same time frame, the outage map had 743,308 page views. Website traffic was highest on March 2, when 238,053 users visited pplelectric.com. Outage-related webpages had 519,000 page views, and the outage map had 226,224 page views.

**QUESTION 12.** Provide the number of followers on the company's Twitter page before March 2 and after March 13.

**Met-Ed**

The @Met-Ed Twitter account grew from 3,251 followers on March 2, 2018, to 3,769 followers on March 11, 2018.

**PECO**

Before March 2, 2018, PECO's Twitter had 8,959 followers, and after March 13, 2018, it had 10,148 followers.

**Penelec**

The @Penelec Twitter account grew from 1,295 followers on March 1, to 1,314 followers on March 11, 2018.

**PCLP**

PCLP does not use Twitter.

**PPL**

On March 1, 2018, PPL's Twitter account had 12,556 followers. On March 14, 2018, it had 12,972 followers.

**Question 13.** Provide the number of likes on the company's Facebook page before March 2 and after March 13.

**Met-Ed**

Met-Ed's Facebook audience increased from 5,360 page likes on March 2, 2018 to 9,367 page likes on March 11, 2018.

**PECO**

PECO's Facebook audience increased from 9,306 page likes on March 1, 2018, to 12,088 page likes on March 14, 2018.

**Penelec**

Penelec's Facebook audience increased from 4,333 page likes on March 1, 2018, to 4,513 page likes on March 5, 2018.

**PCLP**

PCLP's Facebook audience increased from 275 page likes on March 1, 2018, to 810 page likes on March 14, 2018.

**PPL**

On March 1, 2018, PPL's Facebook page had 33,110 likes. On March 14, 2018, it had 36,452 page likes.

**QUESTION 14.** Provide the number of impressions for both Twitter and Facebook between March 2 and up to and including March 13.

**Met-Ed**

Between March 2 and March 11, 2018, Met-Ed's storm-related tweets reached nearly 780,000 Twitter users. During the same time frame, Met-Ed's Facebook posts reached approximately 555,000 people, and nearly 18,500 of those users engaged with the posts by either liking, commenting, or sharing them.

**PECO**

The PECO Twitter had 611,282 impressions, while the PECO Facebook had 597,967 impressions.

**Penelec**

Between March 1 and March 5, 2018, Penelec's storm-related tweets reached approximately 85,000 Twitter users. During the same time frame, Penelec's Facebook posts reached approximately 100,000 people, and nearly 540 of those users engaged with the posts by either like, commenting, or sharing them.

**PCLP**

Between March 1 and March 5, 2018, PCLP's reached approximately 25,600 users due to user sharing among Facebook groups. As stated before, PCLP does not use Twitter.

**PPL**

Between March 2 and March 13, 2018, PPL's storm-related tweets reached 415,758 Twitter users. During the same time frame, PPL's Facebook posts reached 1,127,301 people.

**QUESTION 15.** Provide the following information:

- a. How many outage and hazard calls were received each day from March 2 until March 13;
- b. How many of those calls were answered each day and what was the average answer time each day;
- c. How many calls were not answered each day;
- d. Of the calls that were not answered, how many were due to the volume of calls received;
- e. Indicate if your organization utilized a backup or third-party to manage overflow calls, and if so, detail the dates and times those services were used and the number of calls those services received;
- f. and indicate if any calls during each day received a message indicating all lines are busy and to please call back.

## Met-Ed

a. Outage calls received by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
<b>Calls Received</b>	53,975	28,142	9,701	6,661	4,893	6,423	4,608	4,152	1,859	468

b. Outage calls answered and the Average Speed of Answer (ASA) by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
<b>Calls Received</b>	53,975	28,142	9,701	6,661	4,893	6,423	4,608	4,152	1,859	468
<b>ASA</b>	1	9	1	7	3	8	17	10	2	2

c. Outage Calls Abandoned by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
<b>Calls Abandoned</b>	92	523	13	47	17	81	103	37	1	0

d. Met-Ed does not have any information regarding why a customer abandoned a call.

e. Met-Ed utilized a high-volume third-party call provider, West Corp., during the outage event. West Corp. was used on the following dates and times (24-hour format):

- March 2 between 0730 and 2359
- March 3 between 0000 and 1130
- March 4 between 0900 and 1230
- March 5 between 0800 and 1230
- March 7 between 1230 and 2100
- March 8 between 0800 and 1400

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar
<b>Calls Received</b>	27,298	3	2	5	0	63	1	0	0	0

f. No calls would have been busied-out due to automatic rollover to West Corp. when capacity is reached.

**PECO**

a. Outage Calls received by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar
<b>Calls Received</b>	267,457	242,672	56,609	28,597	17,847	93,762	39,930	6,705	2,448

b. Outage Calls answered and the ASA:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar
<b>Calls Answered</b>	257,972	229,796	55,915	28,002	17,622	92,008	39,303	6,636	2,336
<b>ASA</b>	17	19	6	13	8	11	8	6	55

c. Outage Calls abandoned by day:

Date	43,161	43,162	43,163	43,164	43,165	43,166	43,167	43,168	43,169
<b>Calls Abandoned</b>	9,485	12,876	694	595	225	1,754	627	69	112

d. PECO does not track the reason a customer may choose to abandon a call.

e. All calls were taken internally.

f. Busy Out

Calls:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar
<b>Busy Calls</b>	0	0	0	0	1	0	0	0	0

**Penelec**

a. Outage calls received by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar
<b>Calls Received</b>	20,495	2,950	670	634

b. Outage calls answers and the ASA:

Date	2-Mar	3-Mar	4-Mar	5-Mar
<b>Calls Answered</b>	20,199	2,734	667	616
<b>ASA</b>	8	33	3	22

c. Outage calls abandoned by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar
<b>Calls Abandoned</b>	296	216	3	18

d. Penelec does not have any information regarding why a customer abandoned a call.

e. Penelec utilized a high-volume third-party call provider, West Corp., during the outage event. West Corp. was used on March 2, 2018, between 07:20 a.m. and 11:59 p.m.

Outage calls received by West Corp by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar
<b>Calls Received</b>	9,879	0	0	0

f. No calls would have been busied-out due to automatic rollover to West Corp. when capacity is reached.

**PCLP**

a. Outage calls received by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
<b>Calls Received</b>	717	796	505	353	240	138	143	132	50	12	5	4

b. Outage calls answers and the Average Customer Wait Time

(sec):

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
<b>Calls Answered</b>	162	177	187	122	123	90	110	105	41	10	5	3
<b>Customer Average Wait Time</b>	163	39	0	107	28	12	4	4	28	4	100	0

c. Outage Calls abandoned by

day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
<b>Calls Abandoned</b>	55	32	2	44	8	0	5	2	2	1	0	0

d. Pike County does not have any information regarding why a customer abandoned a call.

e. Pike County utilized the third-party call center Cooperative Resource Center (CRC) starting on March 2, 2018 at 1200. Pike County did not specify the number of outage calls received specifically by the CRC.

f. Pike County did not provide this information.

## PPL

a. Outage calls received by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
<b>Calls Received</b>	63,668	36,206	9,518	8,934	5,669	3,763	1,712	1,217	852	292	783	927

b. Outage calls answers and the Average Speed of Answer

(ASA):

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
<b>Calls Answered</b>	60,681	32,127	9,331	8,884	5,641	3,748	1,704	1,217	834	287	783	927
<b>ASA</b>	78	268	36	7	7	2	2	1	17	14	2	2

c. Outage calls abandoned by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
<b>Calls Abandoned</b>	2,987	4,079	187	50	28	15	8	0	18	5	0	0

d. PPL does not have any information regarding why a customer abandoned a call.

e. PPL utilized a contract call center from March 2 at 1500 to March 5, 2018, at 0800. Outage calls received by call center by day:

Date	2-Mar	3-Mar	4-Mar	5-Mar
<b>Calls Received</b>	27,713	27,072	6,841	982

f. No calls received 'all lines busy' at any time March 2, through March 13, 2018.

**QUESTION 16.** Describe how your company managed messaging regarding estimated times of restoration by providing a general description of your company's progress.

### Met-Ed

Met-Ed's principles to guide the development and implementation of ETRs are as follows:

- Limit misinformation and enhance credibility regarding ETRs by telling customers what Met-Ed knows, when it knows it, and by communicating the uncertainties inherent in an estimate.
- Provide customers with a "worst-case" estimate whenever there is a great degree of uncertainty.
- Provide customers with accurate ETR updates as uncertainty diminishes.

- Keep ETR updates to customers to a minimum and ensure each ETR update contains additional or clearer information than a previously provided ETR.
- Provide customers an accurate ETR as soon as possible.

During large restoration events, ETRs generated by Met-Ed’s outage management system (OMS) are suppressed until such time that the weather event exits that system, it is safe to work, and an adequate damage assessment can be attained. At that time, a global ETR will be established and communicated to customers; as more information is received, ETRs may be further altered. As work is assigned to crews, specific ETRs for projects are created. Messaging provided to customers will be consistent through a live agent, the Interactive Voice Recorder (IVR), website, or texting. ETR updates are delivered simultaneously to all channels.

## **PECO**

PECO determines ETRs by a tiered structure that depends on the length of the storm, total number of customers impacted, and the estimated work/jobs on the system. For instance, all jobs impacting 1,000 or more customers will be restored by X time on X date; all jobs impacting 500 customers or more will be restored by X time on X date; and so forth.

PECO assigns more specific ETRs for jobs where a crew is dispatched and a more accurate ETR is known. ETRs are sometimes adjusted due to nested outages, where after the initial damage is repaired and additional damage is found impacting a particular customer or group of customers.

## **Penelec**

Penelec’s principles to guide the development and implementation of ETRs are as follows:

- Limit misinformation and enhance credibility regarding ETRs by telling customers what Penelec knows, when it knows it, and by communicating the uncertainties of the estimate.
- Provide customers with a “worst-case” estimate when there is a great degree of uncertainty.
- Provide customers with updated ETRs with additional information or more accurate than previously stated.
- Provide customers an accurate ETR as soon as possible.

During larger restoration events, ETRs generated by Penelec’s outage management system (OMS) are withheld until the weather event exits the system, it is safe to work, and damage assessment can be attained. At that time, a global ETR will be released to customers, which may be further adjusted as more information from damage assessments is gathered. As work is assigned to crews, specific ETRs for projects are established.

Messaging provided to customers will be consistent whether through a live agent, interactive voice recorder (IVR), website, or texting. ETR updates are published simultaneously to all channels.

### **PCLP**

Pike County issued messages updating the day, date, and street locations of damage assessment, vegetation removals, and construction/restoration crews were scheduled. These messages were issued in the early morning and mid-evening daily. Initial messaging included the following:

- On March 3, the Milford Borough Council President and a Pike County Commissioner were provided text message updates and progress as the restoration of the Milford Borough and critical care facility Belle Reve were restored.
- On the March 3, 10:36 p.m., a Facebook update provided status on the Borough and indicated what areas by streets name were going to be worked.
- On March 4, the CRC-Call Center was updated with a message indicating areas in progress and an approximate general restoration of all customers remaining out of power expected to be restored.
- On March 5, at 5 p.m., the first Facebook update with approximate general restoration time was posted. Subsequent emails and Facebook updates provided additional dates and locations.
- During the duration of the storm, March 2 through March 13, the Customer Service Office remained opened and staffed 16-18 hours per day responding face to face with approximately 175 customers.

### **PPL**

ETRs were generally job specific ETRs updated the morning in which PPL believed restoration would be finished by 2300 of that day. When crews arrived on-site, a more accurate field ETR was established for each job.

**QUESTION 17.** Describe whether your company suspended automated restoration estimate messaging and if so, provide the dates and times the messaging was suspended and the date and time when it was resumed.

**Met-Ed**

The table below details the date and time of ETR message suspension, global ETRs, and global ETR updates (24-hour format):

<b>District(s)</b>	<b>Date/Time ETRs Suspended</b>	<b>Date/Time Area Specific Global ETRs Enabled or Updated</b>	<b>ETR Applied</b>
York, Hanover, Dillsburg, Gettysburg	March 2 at 0821	March 2 at 2118	March 5 at 2300
	N/A	March 7 at 1825	March 8 at 1600
Reading, Hamburg, Boyertown	March 2 at 0821	March 2 at 2118	March 5 at 2300
	N/A	March 5 at 2113	March 6 at 1600
Lebanon	March 2 at 0821	March 2 at 2118	March 5 at 2300
	N/A	March 5 at 2113	March 6 at 1600
Easton	March 2 at 0821	March 2 at 2118	March 7 at 2300
	March 6 at 2217	March 7 at 1839	March 9 at 2300
Stroudsburg	March 2 at 0821	March 2 at 2118	March 7 at 2300
	March 6 at 2217	March 7 at 1854	March 9 at 2300
	N/A	March 9 at 2257	March 10 at 2300
	N/A	March 10 at 2216	March 11 at 1600
	N/A	March 11 at 1453	March 11 at 2300

**PECO**

Due to the significant impact of Riley on PECO’s system, PECO suspended ETRs beginning on Friday, March 2, 2018, at 01:40 p.m. During this time, PECO did not provide any ETRs to customers. Messages were left on the IVR, customer preference center, mobile site, and social media channels informing customers that ETRs would not be available until an initial storm damage assessment was conducted. Messaging was not posted on PECO’s website (peco.com) due to a technical issue. ETR messaging resumed on Saturday, March 3, 2018, at 06:00 p.m. Following the arrival of Quinn, ETRs were suspended on Tuesday, March 6, 2018, at 10:00 p.m. until Wednesday, March 7, 2018, at 11:00 a.m.

**Penelec**

The table below identifies the date and time of ETR message suspension, systemwide global ETRs, and specific global ETRs. Penelec was not affected Quinn (24-hour format):

<b>District(s)</b>	<b>Date/Time ETRs Suspended</b>	<b>Date/Time Systemwide or Area Specific Global ETRs Enabled</b>	<b>ETR Applied</b>
<b>Warren, Bradford, Towanda, Montrose, Mansfield, Meadville</b>	March 1 at 2145	March 2 at 1251	March 4 at 2300
<b>Erie</b>	March 1 at 2145	March 2 at 1251	March 4 at 2300
	N/A	March 2 at 2050 (area)	March 4 at 2000
<b>Oil City</b>	March 1 at 2145	March 2 at 1251	March 4 at 2300
	N/A	March 2 at 2050 (area)	March 3 at 1800
<b>Johnstown, Altoona, Clearfield, Dubois, Indiana, Somerset</b>	March 1 at 2145	March 2 at 1251	March 4 at 2300
	N/A	March 2 at 2050 (area)	March 3 at 1500
<b>Lewistown, Shippensburg, Dry Run</b>	March 1 at 2145	March 2 at 1251	March 4 at 2300
	N/A	March 2 at 2050 (area)	March 3 at 1600

**PCLP**

Pike County posted ETR updates on their Facebook page, starting on March 3, 2018, at 10:36 p.m. and through their CRC-Call Center, starting on March 4, 2018. Pike County did not suspend ETRs at any time during the duration of the storm event.

**PPL**

ETRs were suppressed on March 2, 2018 in the following regions (24-hour format):

- Lehigh Region, at 1131
- Northeast Region, at 0849
- Central Region, at 1030
- Susquehanna Region, at 0800
- Harrisburg Region, at 1030
- Lancaster Region, at 1132

ETR suppressions were lifted on March 3, 2018, at 1300 for all regions.

**QUESTION 18.** Provide the dates and times that your company began to provide initial restoration estimates to customers calling in to the customer service line and whether those initial estimates were global (system-wide), or geographically specific, and whether customers could access those restoration estimates via the IVR, customer service representatives, website, or all three.

**Met-Ed**

See Met-Ed Response to Question 17. Customers were able to obtain area specific global ETRs via live agent, the IVR, and the website.

**PECO**

Initial ETRs were available to customers beginning on Saturday, March 3, 2018 at 06:00 p.m., based on customer count. This ETR was adjusted as additional outage information became available and crews were assigned to the work. Once ETR messaging resumed, customers could receive the ETR through the IVR, by speaking with a customer service representative, on the company website (peco.com), on the customer preference center, or on the mobile site. PECO also used its Facebook and Twitter accounts to provide high level/global ETR messaging.

**Penelec**

See Penelec response to Question 17. Customers were able to obtain systemwide global ETRs and area specific global ETRs via live agent, the IVR, and the website.

**PCLP**

See PCLP's response to Question 17. ETRs were geographically specific and could be accessed through customer service call centers and the Pike County Facebook page.

**PPL**

PPL's website began outage messaging on March 1, 2018 at 11:30 p.m. PPL began providing geographic restoration times in the following regions at the following times (24-hour format):

- Lehigh Region: March 7 at 2300
- Northeast Region: March 7 at 2300
- Central Region: March 5 at 2300
- Susquehanna Region: March 4 at 2300
- Harrisburg Region: March 4 at 1700
- Lancaster Region: March 4 at 2300

**QUESTION 19.** Provide the dates and times that your company began to provide customer-specific restoration estimates to customers calling in to the customer service line and whether customers could access those restoration estimates via the IVR, customer service representatives, website, or all three.

**Met-Ed**

Order specific ETRs began to be applied on March 3, 2018 at 07:37 a.m. in the western Met-Ed districts; on March 4, 2018, at 02:50 p.m. in some of the eastern districts; on March 5, 2018, at 01:50 p.m. in Easton; and March 7, 2018, at 12:11 p.m. in Stroudsburg. Customers could obtain order specific ETRs via live agent, the IVR, and the website.

**PECO**

During Riley, customer-specific ETRs were available as early as Saturday, March 3, 2018, at 06:00 p.m. During Quinn, customer-specific ETRs were available as early as Wednesday, March 7, 2018, at 11:00 a.m. ETRs automatically populated in the Outage Management System (OMS) or manually populated by an ETR manager were made available to customers through the IVR, customer service representatives, company website (peco.com), customer preference center, and mobile site.

**Penelec**

Order specific ETRs began on March 2, at 12:51 p.m., which customers were able to obtain via live agent, the IVR, and the website.

**PCLP**

Throughout the duration of the storm, March 2 through March 13, 2018, the Customer Service Office was open for 16-18 hours per day to response to face to face customer issues. The CRC-Call Center was updated starting March 4, 2018, and provided geographic and global ETRs for customers. On March 5, 2018, at 05:00 p.m., the first general global ETR was updated to the Facebook page.

**PPL**

Customer-specific ETRs were not provided during the event.

**QUESTION 20.** Provide the dates and times that your company began providing restoration estimate messaging on your outage website and indicate whether the initial estimates were global or geographically specific.

**Met-Ed**

See Met-Ed response to Questions 17 and 19.

**PECO**

ETRs were available the beginning of Saturday March 3, 2018 at 06:00 p.m. and Wednesday March 7, 2018 on PECO's website. Geographically-specific ETRs were provided and adjusted as additional outage information arrived and crews were assigned to work. Customers could also access ETRs through the customer preference center and the mobile site.

**Penelec**

See Penelec response to Questions 17 and 19.

**PCLP**

See PCLP's Response to Questions 17, 18, and 19.

**PPL**

See PPL Response to Question 18.

**QUESTION 21.** Provide the dates and times the restoration messages on your outage websites were updated and the date and time geographically specific restoration estimates were provided—for both the March 2 and March 7 storms.

**Met-Ed**

See Met-Ed Response to Questions 17 and 19.

**PECO**

During Storm Riley, customer specific ETRs were available on PECO's website as early as Saturday, March 3, 2018, at 06:00 p.m. During Quinn, customer specific ETRs were available on the website as early as Wednesday, March 7, 2018, at 11:00 a.m. Estimates were available whenever ETRs were automatically populated in OMS or when an ETR manager manually populated ETRs. These estimates were also accessible through the IVR, customer service representatives, customer preference center, and mobile site.

**Penelec**

See Penelec Response to Questions 17 and 19.

## **PCLP**

See PCLP's Response to Questions 17, 18, and 19.

## **PPL**

PPL ETRs were area/geographically specific and began to be provided to customers on March 3, 2018, at 01:00 p.m. Area specific ETRs are shown below (24-hour format):

- Lehigh Region: March 7 at 2300
- Northeast Region: March 7 at 2300
- Central Region: March 5 at 2300
- Susquehanna Region: March 4 at 2300
- Harrisburg Region: March 4 at 1700
- Lancaster Region: March 4 at 2300

As restoration times were updated in the PPL system, ETRs were automatically updated on their website.

**QUESTION 22.** Indicate if from March 2 through March 13, any of your company linemen, troublemen, damage assessors, or forestry personnel were assigned outside of your service territory to other utilities—whether they be affiliates or foreign companies.

## **Met-Ed**

No Met-Ed resources were assigned outside of the service territory during this timeframe.

## **PECO**

PECO had staff in Puerto Rico as part of the Exelon effort to support restoration after Hurricanes Irma and Maria.

## **Penelec**

From March 1 to March 4, 2018, Penelec resources did not support other companies because Penelec customers were affected by Riley. On March 5, after all Penelec orders with out of service customers were assigned, Penelec mobilized 20 hazard responders, 7 damage assessors, and approximately 50 linemen to support Met-Ed. Penelec also lent support to Jersey Central Power & Light (JCP&L). 14 service resources began supporting JCP&L on March 9. On March 11, 7 damage assessors and approximately 50 linemen began supporting JCP&L after previously supporting Met-Ed. Penelec hazard resources supporting Met-Ed were released on March 12, and Penelec resources supporting JCP&L were released on March 13-14.

**PCLP**

No resources were assigned to other utilities.

**PPL**

At the beginning of the storm, 26 linemen and 12 support personnel were assisting Puerto Rico with power restoration following Hurricane Maria. These employees returned during Riley and were available to work starting on March 6, 2018.

**QUESTION 23.** If yes to number 22 above, please indicate the number of personnel, their job function (linemen, troublemen, etc.), the date they left your service territory and their return date—or expected return date if they have not yet returned.

**Met-Ed**

See Met-Ed Response to Question 22.

**PECO**

During Riley and Quinn, PECO was supporting the restoration effort in Puerto Rico with 16 Aerial Mechanics. This staff departed for Puerto Rico on Feb. 17, 2018, with 7 aerial mechanics returning home on March 4, 2018. The remaining 9 returned on March 19, 2018.

**Penelec**

See Penelec Response to Question 22.

**PCLP**

See PCLP Response to Question 22.

**PPL**

See PPL Response to Question 22.

**QUESTION 24.** Provide the numbers of all personnel, whether company employees, contractors, mutual aid contractors, affiliate mutual aid, or foreign mutual aid that were on property each day during the restoration from March 2 to March 13. Provide this information by each individual work day and not in the aggregate. Also list the personnel by specific job function, such as linemen, troublemen, damage assessors, forestry, flagmen, etc. (see the Excel template attachment.)

## Met-Ed

<b>Total FTEs Available</b>										
	3/2/2018	3/3/2018	3/4/2018	3/5/2018	3/6/2018	3/7/2018	3/8/2018	3/9/2018	3/10/2018	3/11/2018
<b>Linemen Resources</b>										
Company Linemen	160	174	231	263	251	251	255	249	238	178
Contractor Linemen	146	238	344	405	484	604	604	604	605	412
Mutual Aid Linemen	-	-	-	-	-	-	-	-	-	-
Mutual Aid Contractor Linemen	-	-	-	-	-	-	-	-	-	-
<b>Total Linemen Available</b>	306	412	575	668	735	855	859	853	843	590
<b>Other Resources</b>										
Hazard Responders	116	96	78	34	30	26	30	34	28	30
Mutual Aid Hazard Responders	48	84	192	178	168	168	168	32	32	30
Troublemakers	32	33	32	33	34	34	34	30	29	32
Mutual Aid Troublemakers	-	-	-	-	-	-	-	-	-	-
Forestry/Veg Management Workers	10	9	10	9	9	8	10	9	5	5
Contractor Forestry/Veg Mgmt Workers	242	445	442	360	346	313	314	312	312	312
Assessors	-	-	-	25	47	49	52	58	46	53
Contractor Assessors	-	-	-	-	-	-	-	-	-	-
Wire Guards	22	58	70	50	44	46	16	12	18	18
Contractor Wire Guards	-	-	-	-	-	-	-	-	-	-
Electricians	-	-	-	-	-	-	-	-	-	-
Contractor Electricians	-	-	-	-	-	-	-	-	-	-
Energy and other Technicians	-	-	-	-	-	-	-	-	-	-
Substation Workers	-	11	11	11	11	11	11	11	23	12
Company Supporting Staff	105	154	219	276	310	312	278	256	270	171
Mutual Aid/Contractor Supporting Staff	74	116	195	205	229	312	314	297	301	231
<b>Total Other Resources</b>	649	1,006	1,249	1,181	1,228	1,279	1,227	1,051	1,064	894
<b>Total Resources</b>	955	1,418	1,824	1,849	1,963	2,134	2,086	1,904	1,907	1,484

# PECO

<b>Total FTEs Available</b>												
	3/2/2018	3/3/2018	3/4/2018	3/5/2018	3/6/2018	3/7/2018	3/8/2018	3/9/2018	3/10/2018	3/11/2018	3/12/2018	3/13/2018
<b>Linemen Resources</b>												
Company Linemen	385	385	385	385	385	385	385	385	385	385	385	385
Contractor Linemen- Local COCs	125	125	125	125	125	125	125	125	125	125	125	125
Mutual Aid Linemen- Sister Comp	-	-	-	175	175	204	204	204	-	-	-	-
Mutual Aid Contractor Linemen- Includes sister COCs	-	-	211	286	1,029	1,542	1,930	2,458	370	370	370	297
<b>Total Linemen Available</b>	<b>510</b>	<b>510</b>	<b>721</b>	<b>971</b>	<b>1,714</b>	<b>2,256</b>	<b>2,644</b>	<b>3,172</b>	<b>880</b>	<b>880</b>	<b>880</b>	<b>807</b>
<b>Other Resources</b>												
Hazard Responders												
Mutual Aid Hazard Responders												
Troublemen- Included above												
Mutual Aid Troublemen												
Forestry/Veg Management Workers												
Contractor Forestry/Veg Management Workers	301	512	512	573	620	659	830	880	830	830	185	185
Assessors		59	57	57	70	70	78	65	70			
Contractor Assessors												
Wire Guards		114	128	80	80	80	80	80	76			
Contractor Wire Guards				80	80	160	160	164	168			
Electricians												
Contractor Electricians												
Energy and other Technicians	115	110	140	153	154	153	153	153	154			
Substation Workers												
Company Supporting Staff												
Mutual Aid/Contractor Supporting Staff												
<b>Total Other Resources</b>	<b>416</b>	<b>795</b>	<b>837</b>	<b>943</b>	<b>1,004</b>	<b>1,122</b>	<b>1,301</b>	<b>1,342</b>	<b>1,298</b>	<b>830</b>	<b>185</b>	<b>185</b>
<b>Total Resources</b>	<b>926</b>	<b>1,305</b>	<b>1,558</b>	<b>1,914</b>	<b>2,718</b>	<b>3,378</b>	<b>3,945</b>	<b>4,514</b>	<b>2,178</b>	<b>1,710</b>	<b>1,065</b>	<b>992</b>

**Penelec**

<b>Total FTEs Available</b>				
	3/2/2018	3/3/2018	3/4/2018	3/5/2018
<b>Linemen Resources</b>				
Company Linemen	262	262	262	262
Contractor Linemen	33	33	33	-
Mutual Aid Linemen	-	-	-	-
Mutual Aid Contractor Linemen	138	138	103	-
<b>Total Linemen Available</b>	<b>433</b>	<b>433</b>	<b>398</b>	<b>262</b>
<b>Other Resources</b>				
Hazard Responders	103	103	-	-
Mutual Aid Hazard Responders	34	34	-	-
Troublemens	-	-	-	-
Mutual Aid Troublemens	-	-	-	-
Forestry/Veg Management Workers	288	341	119	256
Contractor Forestry/Veg Management Workers	-	-	-	-
Damage Assessors	13	13	-	-
Contractor Damage Assessors	-	-	-	-
Wire Guards	-	-	-	-
Contractor Wire Guards	-	-	-	-
Electricians	-	-	-	-
Contractor Electricians	-	-	-	-
Energy and other Technicians	-	-	-	-
Substation Workers	-	-	-	-
Company Supporting Staff	204	204	161	204
Mutual Aid/Contractor Supporting Staff	22	22	22	-
<b>Total Other Resources</b>	<b>664</b>	<b>717</b>	<b>302</b>	<b>460</b>
<b>Total Resources</b>	<b>1,097</b>	<b>1,150</b>	<b>700</b>	<b>722</b>

**PCLP**

<b>Total FTEs Available</b>	<b>Friday</b>											
	3/2/2018	3/3/2018	3/4/2018	3/5/2018	3/6/2018	3/7/2018	3/8/2018	3/9/2018	3/10/2018	3/11/2018	3/12/2018	3/13/2018
<b>Linemen Resources</b>												
Transition Service Agreement ORU Lineman		3	0	0	0	0	0	0	5	0	0	0
Company Linemen		0	0	0	0	0	0	0	0	0	0	0
Contractor Linemen		7	16	16	19	19	22	23	27	27	19	16
Mutual Aid Linemen		0	0	0	0	0	0	0	5	5	0	0
Mutual Aid Contractor Linemen												
<b>Total Linemen Available</b>	<b>0</b>	<b>10</b>	<b>16</b>	<b>16</b>	<b>19</b>	<b>19</b>	<b>22</b>	<b>23</b>	<b>37</b>	<b>32</b>	<b>19</b>	<b>16</b>
<b>Other Resources</b>												
Hazard Responders - Environmental Contractor			3		3							
Mutual Aid Hazard Responders												
Troublemakers												
Mutual Aid Troublemakers												
Forestry/Veg Management Workers												
Contractor Forestry/Veg Management Workers	5	5	13	13	13	13	13	13	5	5	5	5
Damage Assessors	1	1	1	1	1	1	1	1	1	1	1	1
Contractor Damage Assessors		8	8	8	8	8	8	8	8	8	8	8
Wire Guards												
Contractor Wire Guards												
Electricians												
Contractor Electricians												
Energy and other Technicians												
Substation Workers												
Company Supporting Staff	5	4	5	7	8	8	8	9	8	8	7	6
Mutual Aid/Contractor Supporting Staff									1	1	1	1
Contract Storekeeper	1	1	1	1	1	1	1	1	1	1	1	1
<b>Total Other Resources</b>	<b>11</b>	<b>18</b>	<b>30</b>	<b>29</b>	<b>33</b>	<b>30</b>	<b>30</b>	<b>31</b>	<b>23</b>	<b>23</b>	<b>22</b>	<b>21</b>
<b>Total Resources</b>	<b>11</b>	<b>28</b>	<b>46</b>	<b>45</b>	<b>52</b>	<b>49</b>	<b>52</b>	<b>54</b>	<b>60</b>	<b>55</b>	<b>41</b>	<b>37</b>

**PPL**

<b>Total FTEs Available</b>												
	3/2/2018	3/3/2018	3/4/2018	3/5/2018	3/6/2018	3/7/2018	3/8/2018	3/9/2018	3/10/2018	3/11/2018	3/12/2018	3/13/2018
<b>Linemen Resources</b>												
Company Linemen	232	237	247	250	266	269	229	213	51	18	17	15
Contractor Linemen	183	183	183	189	290	283	283	283	-	-	-	-
Mutual Aid Linemen	108	172	183	454	566	580	580	269	-	-	-	-
Mutual Aid Contractor Linemen	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Linemen Available</b>	<b>523</b>	<b>592</b>	<b>613</b>	<b>893</b>	<b>1,122</b>	<b>1,132</b>	<b>1,092</b>	<b>765</b>	<b>51</b>	<b>18</b>	<b>17</b>	<b>15</b>
<b>Other Resources</b>												
Hazard Responders	-	-	-	-	-	-	-	-	-	-	-	-
Mutual Aid Hazard Responders	-	-	-	-	-	-	-	-	-	-	-	-
Troublemen	22	33	35	26	26	17	18	8	3	1	-	2
Mutual Aid Troublemen	-	-	-	-	-	-	-	-	-	-	-	-
Forestry/Veg Management Workers	15	15	15	15	15	15	15	15	15	15	15	15
Contractor Forestry/Veg Management Workers	195	266	430	463	496	529	469	469	385	332	332	300
Assessors	131	131	98	98	98	98	98	-	-	-	-	-
Contractor Assessors	-	95	95	95	91	91	91	-	-	-	-	-
Wire Guards	10	10	10	10	10	10	10	10	-	-	-	-
Contractor Wire Guards	30	30	30	30	30	30	30	30	-	-	-	-
Electricians	41	44	47	41	47	42	41	33	2	-	-	-
Contractor Electricians	-	-	-	-	-	-	-	-	-	-	-	-
Energy and other Technicians	-	-	-	-	-	-	-	-	-	-	-	-
Substation Workers	51	53	54	53	54	49	41	32	-	-	3	2
Company Supporting Staff	111	256	258	183	165	143	133	86	2	5	3	4
Mutual Aid/Contractor Supporting Staff*												
<b>Total Other Resources</b>	<b>606</b>	<b>933</b>	<b>1,072</b>	<b>1,014</b>	<b>1,032</b>	<b>1,024</b>	<b>946</b>	<b>683</b>	<b>407</b>	<b>353</b>	<b>353</b>	<b>323</b>
<b>Total Resources</b>	<b>1,129</b>	<b>1,525</b>	<b>1,685</b>	<b>1,907</b>	<b>2,154</b>	<b>2,156</b>	<b>2,038</b>	<b>1,448</b>	<b>458</b>	<b>371</b>	<b>370</b>	<b>338</b>

**QUESTION 25.** Provide the number of all personnel, whether company employees, mutual aid contractors, affiliate mutual aid, or foreign mutual aid that actively worked on restoration or assessment activities each day during the restoration from March 2 through March 13, Provide this information by each individual work day and not in the aggregate. Also list the personnel by specific job function, such as linemen, troublemen, damage assessors, forestry, flagmen, etc.

**Met-Ed**

See Met-Ed Response to Question 24. Resources counted as being on property each day also actively worked on restoration or assessment activities each day except for the period of March 7, 2018 at 12:00 p.m. through March 8, 2018 at 06:00 a.m. in Easton and Stroudsburg, during which period resources were unavailable due to unsafe travel conditions from Quinn.

**PECO**

See PECO Response to Question 24. Once PECO has a resource on the property, that resource is counted as personnel, as depicted in the chart. PECO considers those resources as actively working unless they are not on a shift (i.e., sleeping in this case). Crews work 16-hour shifts, with eight hours off. The attached information has personnel by calendar day, not by shift.

## **Penelec**

See Penelec County Response to Question 24.

## **PCLP**

See PCLP Response to Question 24.

## **PPL**

See PPL Response to Question 24.

**QUESTION 26.** Describe how job orders and/or other restoration projects were assigned to internal and external crews, including the prioritization of work, how workplace safety was maintained, and whether certain jobs had teams of crews.

## **Met-Ed**

Job orders were assigned to internal and external line and forestry crews in the following manner:

- Road closure and hazard orders regarding downed wires situations and establish a safe area were top priority jobs assigned to assessment crews. Internal and external crew leads were assigned outage projects in PowerOn by working directly with a Distribution System Operator over the phone.
- Contractor foremen were assigned packets of outage projects in PowerOn by working directly with a Distribution Control Center dispatcher over the phone. Contractor foremen then distributed these orders to their crew leaders.
- Internal and external crew leads were assigned outage projects in PowerOn and given hard copies of job packages at staging sites from work management personnel.
- Contractor foremen were assigned packages of outage projects in PowerOn by line shop dispatchers and given a hard copy of job packages at staging sites from work management personnel. These orders were then subsequently distributed by the contractor foremen to their crew leaders.
- Quarantined circuit leads were assigned all quarantined circuit outage projects. Each quarantine circuit lead was assigned teams of crews to repair all damage found on the quarantined circuit. See subpart Teams of crews below for more information regarding the Met-Ed quarantine process.
- Forestry crews were assigned projects on PowerOn directly from Met-Ed forestry specialists. Outage project prioritization began with safety, then restoring the largest blocks of customers first.

Outage projects with the largest number of out of service customers were given higher priority. The general order of precedence includes repairing transmission and sub-transmission lines (substation feeds), energizing substations, repairing and energizing distribution circuit three-phase main backbone, repairing and energizing distribution single phase circuit taps off the three-phase backbone, and repairing individual customer services.

As result of the extensive damage in PCLP, Met-Ed quarantined nine circuits. During quarantine, the circuit is deenergized and damage assessors patrol the circuit in its entirety to identify and document the damage (e.g., number of broken poles and equipment needs.) Next, tree and line crews follow closely behind while working in parallel to remove trees and limbs and make repairs. This process eliminates bottlenecks, optimizes response times, improves internal and external communications, maximizes resource utilization, and allows for improved data and information flow during large-scale emergency restoration events. Large teams of line workers were assigned to quarantine circuit leads who were responsible for all repairs on the quarantined circuit.

All internal crews are trained and held accountable to follow all FirstEnergy safe work practices and comply with the FirstEnergy Accident Handbook. Supervisors were sent specific safety information every morning to be delivered to workers at their morning safety stand ups. Corporate safety pushed safety messages to Met-Ed employees with Mobile Data Terminals. All external line and forestry crews were given an on-boarding safety briefing that provided an explanation of Met-Ed's electrical system voltages/configurations and established expectations that they are required to follow their employer's and OSHA safe work practices. FirstEnergy safety representatives continuously performed job site safety checks on all internal and external crews to ensure compliance with safe work practices and to answer questions. One flagging contractor was injured while flagging for traffic control when she was struck by a vehicle during Met-Ed's restoration effort. She was taken by ambulance to the hospital where she was treated for neck and shoulder pain and released the same day.

## **PECO**

Outage tickets were prioritized based on largest customer count, utilizing smaller-sized PECO crews to identify damage, isolate the damage from the system, and then restore as many customers as possible before moving to the next large customer count job. Later, larger-sized crews would repair damage to restore any remaining customers from the initial ticket. Outage tickets involving critical customers, such as hospitals, pumping plants, etc. were also prioritized for restoration. Lastly, tickets involving police/fire or road closures were prioritized with a subset of the available resources.

External mutual assistance crews were on-boarded by Safety Department resources prior to working. External mutual assistance crews were generally assigned the damage-repair jobs, allowing PECO resources to focus on isolating damage and restoring customers.

## **Penelec**

Job orders to internal and external line and forestry crews were assigned in the following manner:

- Road closure and hazard orders regarding downed wires situations and establish a safe area were top priority jobs assigned to assessment crews. Internal crew leads were assigned outage projects in PowerOn by working directly with a Distribution System Operator over the radio or phone.
- Contractor foremen were assigned packets of outage projects in PowerOn by working directly with a Distribution System Operator over the phone. Contractor foremen then distributed these orders to their crew leaders.
- Penelec crew leads were assigned outage projects in PowerOn by line shop dispatchers and job packages sent electronically to their Mobile Data Terminal.
- Contractor foremen were assigned packages of outage projects in PowerOn by line shop dispatchers and given a hard copy of job packages at district offices by the work plan analyst. These orders were then subsequently distributed by the contractor foremen to their crew leaders.
- Forestry crews were assigned projects on PowerOn directly from Penelec forestry specialists.

Outage project prioritization began with safety, then restoring the largest blocks of customers first. Outage projects with the largest number of affected customers were given higher priority. The general order of precedence includes repairing transmissions and sub-transmission lines (substation feeds), energizing substations, repairing and energizing distribution circuit three-phase main backbone, repairing and energizing distribution single phase circuit taps off the three-phase back bone, and repairing individual customer services.

No large teams of crews were assigned together, despite several areas of heavily damaged circuits that required more than one crew to complete the work.

All internal crews are trained and held accountable to follow all FirstEnergy safe work practices and comply with the FirstEnergy Accident Prevention Handbook. Supervisors delivered specific safety information to workers every morning at their morning safety stand ups. Corporate safety pushed safety messages to Penelec employees with Mobile Data Terminals. All external line and forestry crews were given an on-boarding safety briefing that provided an explanation of Penelec's electrical system voltages/configurations and established expectations that they are required to follow their employer's and OSHA safe work practices. FirstEnergy safety representatives continuously performed job site safety

checks on internal and external crews to ensure compliance with safe work practices and to answer questions. No employee or contractor injuries occurred during Penelec's restoration effort.

### **PCLP**

The restoration process began with the assigning of damage assessors, followed by vegetation removal crews and then construction crews. Due to the PCLP system design, the areas affected by Riley are supplied from the radial portion of the system. Initial restoration began by isolating single or three phase laterals from the mainline that had confirmed damage, continuing to clear off the damage or vegetation, and then restoring the mainline after closing the main line switches. Damage Assessment and vegetation removal occurred on the damaged laterals prior to construction. To restore customers quickly, additional isolation of the circuit feeding into lateral areas occurred when minimal vegetation removal or repairs were accomplished quickly. The prioritization of the lateral areas was based on:

- Quantity and type of damage assessed and identified in segmented areas or streets
- Accessibility to work the damage (off-road, specialized equipment required)
- Number of customers restorable
- Customer owned equipment requiring repair

Two electrical contractors were assigned to each job and utilized based on the expected duration and equipment available. Both companies provided two pole setting crews, one provided an off-road track machine, and both provided poles.

### **PPL**

Safety is PPL's top concern in restoration efforts, and it provides employees with daily safety messages. The first topic of every restoration strategy is safety. PPL's first restoration priority is supporting firefighters, police, and critical public safety facilities. The second priority is restoring major power lines and substations that serve a large number of customers. This brings the largest number of customers back to service as quickly as possible.

PPL uses assessors to determine the extent of storm damages prior to sending in repair crews to ensure that crews have the right material, equipment, and personnel to safely complete the job. Smaller crews are often team-up or larger specialized crews are assigned to streamline restoration in jobs with extensive damage, such as multiple poles and spans of wire down. Each job is screened, and proper resources are assigned during the creation of restoration strategies.

**QUESTION 27.** Describe how foreign line and forestry crews were onboarded, trained, and assigned job orders and/or other restoration projects.

**Met-Ed**

See Met-Ed's Response to Question 26.

**PECO**

The onboarding process for foreign crews started with rosters provided to the Foreign Contract Crews (FCCs) from the Contract Crew Emergency Response Manager. As the crews arrived at PECO's Regional Storm Centers, their supervisors reviewed the rosters for staffing and equipment accuracy with PECO. After confirming those details, PECO provided a safety briefing and Safety Restoration Guides where the crews are given the information needed to restore service to PECO customers. They were provided the opportunity to ask questions, with the most frequent questions centering around PECO's circuit prints or job packages.

Each morning, crews received work packages created by the overnight team based on the established restoration strategy. Foreign crews were assigned a specific dispatcher who tracked their work progress. After the first wave of work was completed, additional work was dispatched electronically from the dispatcher to the crews.

**Penelec**

See Penelec's Response to Question 26.

**PCLP**

See PCLP Response to Question 26. Two electrical contractors were assigned to jobs based on the predicted duration and equipment available, with both providing two pole setting crews and poles. Both contractors provided seven to 27 qualified linemen FTEs, material handling, and squirt buckets to all outage locations. PCLP did not provide information on how foreign line and forestry crews were onboarded or trained.

**PPL**

Once foreign line crews and other support workers reached their location, PPL provided them with a briefing and a book on Safety. Line workers and support staff received a 20-30-minute safety briefing and a book on the PPL system. Crew leaders qualified to perform Permit and Tag received an additional 30-minute briefing and a book on PPL's Energy Control system.

Upon completion of the briefings, the teams were met by their PPL Permit Holders. The PPL Permit Holders directed their work and assigned jobs they received from the Restore app to crews under their management.

All tree crews reviewed PPL Safety and Restoration procedures via in person meetings at staging areas, which gave foreign tree crews the opportunity to ask questions and help clarify PPL procedures. Foreign tree crews were assigned a PPL representative who assigned them jobs.

**QUESTION 28.** For each day March 3 through March 13, provide the following information:

- a. a listing of each job order assigned in [this part was individual for each company and was specific to the most affected counties during Riley and Quinn], and the personnel (whether company employees, contractors, mutual aid contractors, affiliate mutual aid, or foreign mutual aid) assigned to each job order. Provide this information by each individual work day and not in the aggregate.
- b. a listing of the personnel for each job order from “28.a,” above, by specific job function, such as linemen, troublemen, damage assessors, forestry, flagmen, etc.
- c. for each job order from “28.a,” above, if not already included in the job order, indicate the voltage of the conductors that were worked on or were supported by the work performed (i.e., crossarm repairs, transformer repairs, pole replacements, substation work, etc.), and whether those conductors were: a backbone feeder to a substation, a distribution feeder from a substation, a primary distribution conductor, a secondary conductor, a service line, or other conductor.

While the EDCs were able to provide most of the data requested, it was apparent that not all of the data could be provided, given certain system and process constraints. For example, the large EDCs could not provide the number of personnel assigned to each job order, which also led to insufficient information to answer 28(b). TUS staff also found the information provided in 28(c) varied by EDC in terms of the ability of the EDC to specify the particulars of each job. TUS also considers that the information flowing back to the EDC from the field and from the customer call is only as good as the ability of the worker or call taker to disseminate. This issue is especially prevalent when EDCs are dealing with thousands of calls and hundreds to thousands of job orders each day, not to mention the large number of foreign workers on the system as part of mutual aid and contracting. Invariably, the details must be taken with a large caveat as to their accuracy. Also, of note is that the job orders are only in those areas where the EDCs appeared to have the longest duration outages – it does not include their entire service territories.

Given the caveats outlined, above, TUS staff was able to derive a chart that it could use to make a comparison of the number of total available crews for the EDCs as compared to the number of job orders

assigned in the heavily impacted areas. TUS used just the 3 largest EDCs as it is not a fair comparison to bring in PCLP, which is a very small EDC with a small service territory. Also, Penelec was not as heavily impacted and was restored relatively quickly, so Penelec is also excluded in this comparison.

Based on the comparison, as shown below, TUS has the following observations.

- All EDCs significantly increased available crews throughout the response. Note that Met-Ed is a much smaller utility in terms of the number of customers as compared to PPL and PECO, and their normal manpower complement (including contractors of choice) is smaller.
- PECO’s number of job orders spiked with the heavy snow in the Bucks County area on March 7. Met-Ed’s job orders appeared to lower due to the heavier snow (in amounts, not weight) in the northeast on March 7. PPL did not appear to be significantly impacted in the areas by the March 7 snow.
- The smaller number of job orders for Met-Ed on March 2 and 3 appears to comport with the information they provided regarding the impacts to feeder lines in those areas and that work needed to be completed on those lines before restoration work from the substations out.
- TUS will follow up with Met-Ed on the workflow issue in terms of having a presence in the affected areas, understanding the work on the backbone issues – TUS needs to discuss and review this further with Met-Ed.

# of Job Orders												
	3/2/2018	3/3/2018	3/4/2018	3/5/2018	3/6/2018	3/7/2018	3/8/2018	3/9/2018	3/10/2018	3/11/2018		
PECO - all counties except Philadelphia	2,308	1,219	935	697	580	1,388	829	467	175	-		
PPL - Lehigh, Pike, Monroe, and Wayne counties	637	106	129	141	136	109	96	54	12	-		
Met-Ed - Monroe, Northampton, and Pike Counties	16	56	261	242	180	51	378	283	388	238		
# of Available Line Crews - Company, Contractor, Mutual Aid, and Mutual Aid Contractor Linemen												
	3/2/2018	3/3/2018	3/4/2018	3/5/2018	3/6/2018	3/7/2018	3/8/2018	3/9/2018	3/10/2018	3/11/2018		
PECO	510	510	721	971	1,714	2,256	2,644	3,172	880	880		
PPL	523	592	613	893	1,122	1,132	1,092	765	51	18		
Met-ED	306	412	575	668	735	855	859	853	843	590		

**QUESTION 29.** Provide the following information related to vegetation management for [this part was individual for each company and was specific to the most affected counties during Riley and Quinn]:

- for the distribution circuits that experienced a full or partial outage from March 2 through March 13, indicate the date of the most recent tree trimming cycle for each circuit and provide a general map of the circuit locations for each county;
- and describe the tree trimming work that was performed on the circuits described in “29.a,” above, i.e., ground-to-sky, v-cut, overhang allowed, etc.

All of the circuits for the EDCs appeared to have been within their vegetation management cycles and per the specifications, consistent with their required Inspection and Maintenance Plans.<sup>15</sup>

**QUESTION 30.** Describe the damage assessment process for your organization, including:

- a. A description of how damage assessments are performed, and the technologies employed by your organization during the assessments for the March 2 and March 7 storms.
- b. The number of damage assessors that actively worked on damage assessment activated for each day from March 2 through March 13.
- c. The date and time of completion for damage assessments for transmission and distribution facilities for both the March 2 and March 7 storm.

### **Met-Ed**

a. Hazard responder teams of one or two people are used to identify, communicate, and make safe all verified wire-down locations at specific assigned locations. If no electrical hazard is found, the hazard responder reports the situation and proceeds to the next location as directed. If a hazard is found, the hazard responder provides the details of the condition, and subsequently safeguards the location and stands by, if necessary, until relieved by another hazard responder, line or service crew, or public protector. Hazard responders provide a detailed assessment of the hazardous conditions using the FirstEnergy iPhone Hazard App. The damage assessment process is used to properly and effectively determine system damage.

Two damage assessment processes were utilized during the restoration process. Circuit-based assessment is used when an affected circuit is quarantined, and order-based assessment is used for outages on a non-quarantined circuit. Both assessment processes initiate, organize, and dispatch qualified damage assessors to locations requiring additional evaluation, whether it's due to the complexity or the amount of damage to circuit facilities. The assessment quantifies the amount of material, equipment, and personnel needed to support restoration efforts and summarizes the needs and requirements for all aspects of each restoration project. Information from the damage assessment is recorded on a hand-held device, which relays equipment and staffing information to the line department.

Met-Ed's hazard process began on March 2, 2018, and the damage assessment process began on March 5, 2018.

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<sup>15</sup> See here for all approved EDC Inspection & Maintenance Plans:  
[http://www.puc.pa.gov/about\\_puc/consolidated\\_case\\_view.aspx?Docket=M-2009-2094773](http://www.puc.pa.gov/about_puc/consolidated_case_view.aspx?Docket=M-2009-2094773).

b. The following hazard responder and damage assessor resources actively worked during the period of March 2-11, 2018:

Resource Type	3/2/2018	3/3/2018	3/4/2018	3/5/2018	3/6/2018	3/7/2018	3/8/2018	3/9/2018	3/10/2018	3/11/2018
Hazard Responders	116	96	78	34	30	26	30	34	28	30
Hazard Responders (Mutual Assistance)	48	84	192	178	168	168	168	32	32	30
Damage Assessors	0	0	0	25	47	49	52	58	46	53
<b>Total FTEs Available</b>	164	180	270	237	245	243	250	124	106	113

TUS notes that Met-Ed reported no damage assessors were working in Met-Ed until March 5. This is highly unusual as all the other EDCs had damage assessors in the field well before March 5.

c. Riley contributed the greatest damage to Met-Ed’s system, while Quinn created travel hazards, road closures, and new outages. Additional hazards or damage assessment needs resulting from Quinn were minimal. Hazard and damage assessment from Riley concluded on March 11, 2018 at 1500.

**PECO**

a. Damage Assessments are performed following PECO’s damage assessment process. The assessments are coordinated regionally by the Damage Assessment Coordinators (DAC) and performed by the patrollers/damage assessors. The work, with notes and associated information, is housed and documented within PECO’s Outage Management System (OMS).

The DAC dispatches outage events from OMS to trained patrollers in the field to conduct damage assessments. DAC provides the patroller with the circuit number, location, customer name, address, and phone number if available, along with any other information from OMS, such as the predicted isolation device.

The patroller will walkdown the complete circuit and identify and damage found, typically found to be fuse, transformer, and interposer events. Solid portion events are also patrolled if needed. The patroller’s assessment is then sent to DAC, who puts the information into OMS on that outage event. As damage assessment continues, materials are ordered, vegetation management is arranged and dispatched, coordination with Verizon is established, and PA One Calls are performed. This information is also used by repair crews to understand job details and needs. Restoration work proceeds in parallel with damage assessment across the territory; restoration work is not delayed when damage assessment occurs.

b. PECO had 12 Damage Assessment Coordinators and between 125-135 field damage assessors for the duration beginning at 06:00 hours on March 3, 2018, until between 21:00 and 22:00 hours on March 10, 2018. For the number of assessors working each day, see PECO Response to Question 24.

c. The damage assessment operation began at 06:00 hours on March 3, 2018 and ended between 21:00 and 22:00 hours on March 10, 2018.

**Penelec**

a. Hazard responder teams of one or two people identify, communicate, and make safe all verified wire-down locations in specific assigned locations. If no electrical hazard is found, the hazard responder reports the situation and proceeds to the next location as directed. If a hazard is found, the hazard responder provides the details of the condition, and subsequently safeguards the location and stands by, if necessary, until relieved by another hazard responder, line or service crew, or public protector. Hazard responders provide a detailed assessment of hazardous conditions using the FirstEnergy iPhone Hazard APP.

The damage assessment process is used to properly and effectively determine system damage. Damage assessment processes initiate, organize, and dispatch qualified damage assessors to locations needing additional evaluation due to the complexity or amount of damage to circuit facilities. The assessment quantifies the amount of material, equipment, and personnel needed to support restoration efforts and summarizes the needs and requirements for all aspects of each restoration project. Information from the assessment is recorded on a hand-held device, which then relays equipment and staffing information to the line department.

Penelec’s hazard and damage assessment process worked in parallel during Riley.

b. The following hazard responder and damage assessor resources actively worked during the period of March 1-3, 3018:

<b>Resource Type</b>	3/2/2019	3/3/2019	3/4/2019	3/5/2019
Hazard Responders	103	103	0	0
Hazard Responders (Mutual Assistance)	34	34	0	0
Damage Assessors	13	13	0	0
<b>Total FTEs Available</b>	150	150	0	0

c. Hazard and damage assessment concluded on March 3, 2018 at 2100. Penelec was not affected by the March 7 storm.

## **PCLP**

- a. Damage Assessment (DA) is a continuous process that provided initial assessment of damages and refined field data to improve site construction crew efficiency. In areas with significant vegetation damage that caused poles, transformers, and conductors to be on the ground, construction crew leaders were able to better plan the work assigned based on this refined data. In advance, crew leaders identified where opens and fields grounds would be installed, and were aware of the number of poles, transformers, and pole top apertures that would be required to rebuild the distribution and service infrastructure.
- b. DA was comprised of 4 two-man contractor crews and one Corning Natural Gas crew. See PCLP Response to Question 24 for more information.
- c. PCLP's last damage assessment update for Storm Riley was posted on March 5, 2018, at 18:04 hours and its last damage assessment update for Storm Quinn was posted on March 8, 2018, at 19:16 hours. PCLP did not determine if these were damage assessments for transmission and distribution facilities in its updates.

## **PPL**

- a. A visual assessment is performed by trained assessors. The assessment is completed, with the specific damage noted in the job ticket and the information completed online or in the field. This process gives the work manager real time information needed to prioritize and staff repairs for specific jobs.
- b. See PPL Response to Question 24.
- c. The damage to the transmission system was minimal, resulting in no assessments performed. Two jobs were immediately dispatched for repairs and assessed by repair crews (i.e. lineman) as repairs were conducted.

The damage assessment for the distribution system was completed on March 8, 2018.

**QUESTIONS 31 AND 32.** Indicate if any of the circuits that experienced a full or partial outage from 00:00 hours on March 2, 2018, through 24:00 March 13, 2018 were one of the worst performing 5% of circuits identified in the EDC's Quarterly Reliability Reports for any of the rolling 12-month quarters in 2017. For each of those circuits identified, provide:

- a. list any full or partial circuit outage over 24 hours in duration.
- b. where there are instances of multiple outages of 24 hours or greater occurring on the

same circuit, list each outage separately and group the outages by circuit.

c. when listing the outages by circuit, include the following information in regard to the circuit: the circuit ID number; the circuit's substation; the general geographic region the circuit serves; and the county(s) or political district(s) the circuit serves.

d. on each full or partial outage listing, provide the following information: the date and time of the first interruption and the date and time the final customer was restored; the proximate cause of the outage; and a general description of the terrain served by the circuit.

Due to the voluminous data point submitted, the key information is summarized below for each utility.

### **Met-ED**

Information of note from Met-Ed's data includes:

- 61 circuits from the worst performing circuits (WPC) experienced an outage.
- There were 532 outages that lasted over 24 hours.
- 232 of the outages were on circuits identified with the Shawnee Substation, which was described as a rural location.
- 360 of the outages were caused by off-right-of-way (ROW) trees or branches. The next highest cause was equipment failure, which caused 50 of the outages.

### **PECO**

Information of note from PECO's data includes:

- 89 circuits from the WPC experienced an outage.
- There were 458 outages of over 24 hours.
- 92 of the outages were on circuits identified with the Buckingham Substation.
- 186 of the outages were caused by vegetation issues (ROW and off-ROW were not delineated) and there were 40 outages listed as unknown and 196 "other."

### **Penelec**

Information of note from Penelec's data includes:

- 72 circuits from the WPC experienced an outage.
- There were 83 outages of over 24 hours.
- 59 of the outages were caused by off-right-of-way (ROW) trees or branches.

## **PCLP**

PCLP is not required to monitor worst performing circuits as they only have 4 circuits.

## **PPL**

Information of note from PPL's data includes:

- 96 circuits from the WPC experienced an outage.
- There were 360 outages of over 24 hours.
- No substation or substations appeared to have a significant number of outages as compared to the others.
- 340 of the outages were caused by trees. PPL does not differentiate between on ROW and off-ROW trees when entering an outage cause.

**Question 33 through 37 concerned the implementation of the storm preparation and response measures outlined in the policy statement memorialized at 52 Pa. Code § 69.1903.**

**QUESTION 33. § 69.1903(a) – EDC Liaisons to Counties.** Indicate all counties that your company offered a liaison to and the dates and times of those offers, as well as the counties that accepted and the dates and times the liaisons worked at those counties. Also indicate any coordination with other EDCs for counties served by multiple EDCs.

### **Met-Ed**

On March 1, 2018, between 1200 and 1315, Met-Ed offered to provide an EDC liaison to EMA directors in Adams, Bucks, Berks, Chester, Cumberland, Dauphin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Pike, and York Counties. None of the EMA directors requested a liaison at that time.

At later dates, Bucks, Monroe, and Pike Counties EMA directors requested a liaison. Met-Ed made a liaison available to each county's EMA until the EMA determined it no longer needed a liaison. Bucks County requested a liaison from March 6 at 0700 until March 8 at 1900. Monroe County requested a liaison from March 7, at 1200 until March 9, at 1700. PCLP requested a liaison from March 5 at 1200 until March 9 at 1400.

Met-Ed did not identify any coordination needs with other EDCs in counties with multiple EDC providers.

## **PECO**

PECO had liaisons in Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties. For Riley, offers were made to the counties between March 1 and March 2, 2018. For Quinn, offers were made on March 6, 2018.

## **Penelec**

Penelec External Affairs Managers maintain relationships with EMAs throughout the Penelec service territory. During normal meetings and communications, all county EMA staff are informed that they can contact an External Affairs Manager at any time to obtain information and/or request a liaison for their office. Liaisons were not requested in any affected counties during the storm event. There was no need to coordinate with other EDCs for this purpose during the storm event.

## **PCLP**

County liaison was not requested by the County to physically report to the PCLP 911 Center. Two PCLP liaisons at the PCLP headquarters established direct communication with the County via telephone, email, and text.

PCLP was in a Transition Service Agreement with Orange and Rockland Utilities, was the sole provider of emergency response, and was not the host of any drills.

## **PPL**

PPL's EMA/911 response team contacted or visited emergency management agencies and/or 911 operation centers in Bucks, Lackawanna, Pike, and Wayne Counties. Calls began on March 2, 2018 and continued via phone and electronic means throughout the event. PPL representatives were available on a direct line to streamline concerns received at EMA.

**QUESTION 34. § 69.1903(b) – EDC Regional Conference Calls.** Provide the dates and times of any regional conference calls and the invited audience.

## **Met-Ed**

Met-Ed hosted 7 conference calls for elected and public officials, and key stakeholders from Monroe, Northampton, and Pike Counties. The conference calls were held at the following dates and times (24-hour format):

- March 4, 2018 at 1300
- March 5, 2018 at 1600

- March 6, 2018 at 1600
- March 7, 2018 at 1600
- March 8, 2018 at 1600
- March 9, 2018 at 1600
- March 10, 2018 at 1600

### **PECO**

PECO held separate conference calls for County Emergency Operations Center Directors, Municipal Officials, and Elected Officials. The County EOC calls all occurred at 12:00 starting on March 3, 2018 through and including March 9, 2018. Municipal Official calls were held on these same dates, all at 14:00 hours. Elected Official calls were also held on these same dates, all at 15:00 hours. Officials included in the conference calls are Scott T. Forster, Director, Bucks County Emergency Management Services, Robert Kagel, Director, Chester County Emergency Services, Tim Boyce, Director, Delaware County Emergency Services, Tom Sullivan, Director, Public Safety Montgomery County, Daniel Bradley, Director, City of Philadelphia, Emergency Management, and Mike Fetrow, Director, York County Office of Emergency Management.

### **Penelec**

Penelec did not conduct any regional conference calls during Riley.

### **PCLP**

PCLP did not conduct any regional conference calls during Riley.

### **PPL**

PPL held conference calls for elected officials in the Lehigh and Northeast regions on March 3, 4, 5, 6, and 7 at 16:00 hours. After March 7, calls were made directly with the impacted regions.

**QUESTION 35. § 69.1903(c) – EDC Storm Exercises.** Provide the dates and times of any storm exercise held in 2017 and the invited parties.

### **Met-Ed**

Met-Ed held a 2017 storm exercise on April 20, 2017, beginning at 08:00. Invited participants included Met-Ed employees with key roles in managing a restoration event, such as employees from Met-Ed leadership, operations, the Distribution Control Center, forestry, hazard, customer support, communications, external affairs, and FirstEnergy Utilities' Emergency Operations Center. Additionally,

an invitation was made to and accepted by representatives from the Pennsylvania Public Utility Commission's Bureau of Technical Utility Services. Met-Ed's storm exercise for 2018 is scheduled for April 17 with similar participants invited.

### **PECO**

PECO held its 2017 Summer Drills on May 2 and May 11, 2017. Between these two drills, PECO's entire Emergency Response Organization (ERO) was activated and drilled for Storm Response activity and roles. All employees with storm response duties were included in these drills. The PUC was invited but could not attend the drills in 2017.

### **Penelec**

Penelec originally scheduled a storm exercise for May 1, 2017, but had to postpone due to a major storm even that impacted Penelec on that day. The exercise was rescheduled for November 8, 2017 starting at 08:00 hours. Participants included Penelec employees with key management roles in a restoration event, such as employees from Penelec leadership, operation, the Distribution Control Center, forestry, hazard, customer support, communications, external affairs, and FirstEnergy Utilities' Emergency Operations Center. Invitations were also provided to representatives from county EMAs, local and state officials, fire, and police. County EMAs invited were from Bedford, Blair, Cambria, Centre, Clearfield, Cumberland, Franklin, Huntingdon, Indiana, Jefferson, Juniata, Mifflin, Perry, and Somerset Counties. The PA Public Utility Commission's Bureau of Technical Utility Services also was invited.

### **PCLP**

PCLP did not host any storm exercises in 2017 because PCLP is a participant in the Transition Service Agreement with Orange and Rockland Utilities.

### **PPL**

PPL conducted numerous storm exercises in 2017, with a minimum of one per month in each region. Employees holding emergency roles involved a broad range of responsibilities attended the sessions.

**QUESTION 36. § 69.1903(e) – EDC Major Service Outage Event After Action Reviews.** Describe how your company will participate in this initiative.

### **Met-Ed**

Met-Ed has completed two after action review meetings. The meetings were held on April 3 and April 5, 2018. Attendees include Met-Ed leadership, FirstEnergy Utilities (FEU) leadership, and FEU Emergency

Operations Center representatives. A third meeting was scheduled for April 25, 2018, and will include Met-Ed leadership and operations management personnel. Upon completion of the meetings, an after-action review report will be compiled to identify strengths, lessons learned, corrective actions, the individual/organization responsible for completing the corrective action, and a timeline for completion.

### **PECO**

PECO will conduct its after action review to identify internally and externally what went well and what the company can improve upon with its storm restoration process. As part of the process, PECO will participate in after action review with other impacted EDCs through the EDC Best Practices Working Group. A first post-storm meeting of that group has already been scheduled. PECO expected to have a report on the Working Group's review progress at the Energy Association of Pennsylvania's Fall T&D Conference.

### **Penelec**

Penelec held its after action review meeting on March 23, 2018. Attendees included Penelec leadership and operations management personnel and FirstEnergy Utilities personnel. An after-action review report will be compiled to identify strengths, lessons learned, corrective actions, the individual/organization responsible for completing the corrective actions, and a timeline for completion.

### **PCLP**

PCLP will be conducting an internal after-action review. The PCLP Emergency Operations Center conducted a review with representatives of state and local government, fire departments, PA-DOT, and National Park Service rangers to discuss the electric/cable/telephone utilities and contractor crews working on restoration efforts. Seventy representatives of state and local organizations attended the review. A "white paper" will be created and sent to the three electric utilities serving Pike County. Of the three utilities, PCLP was found to have had the quickest restoration response.

Pike County 911 Center is planning a follow up meeting for utility response and preparation. Storm Riley is the first significant storm that has impacted Pike County since PCLP became part of Corning Natural Gas Holding Company.

### **PPL**

As with all events, PPL conducted an "After Action Review" for this event and is incorporating improvement opportunities into our emergency response processes.

**QUESTION 37. § 69.1903(f) – EDC Storm Outage Prediction Models.** Describe how your company utilized a storm damage and outage prediction model and if your company provided the Commission with the model predictions per 52 Pa. Code § 69.1903(f)(5).

### **Met-Ed**

The Outage Volume Model (OVM) estimates customer outages and outage orders based on historical event data. The OVM is used in conjunction with other tools and decision making when planning for an outage event. Based on the weather forecast issued by FirstEnergy Meteorological Services on February 28, 2018, Met-Ed anticipated a significant impact to its service territory as the event was predicted to be slowing moving with high winds and heavy, wet snow.

Met-Ed ran the OVM on Feb. 28 and March 1, 2018, in advance of Riley. In both instances, the estimated number of impacted customers and the corresponding estimated outage order volume was low. Because the OVM is based on historical event data, it relies on the history of “like” events in its calculation. Historical data corresponding with a slow-moving storm with high winds and heavy, wet snow are minimal, resulting in estimates that may not be realistic. As news events occur, the data is added to the OVM to improve its outputs. Because the OVM results were not realistic, Met-Ed continued to plan for a significant weather event. Although the OVM ran on March 6, 2018, in advance of Quinn, the information was not used in any significant way as Met-Ed was already in full storm mode, with a large workforce deployed in areas that Quinn was anticipated to affect. The OVM results were not shared with the PA Public Utility Commission’s Bureau of Technical Utility Services.

### **PECO**

To help prepare for any storm, PECO compares the predicted forecast to previous storms with similar forecasts. In this case, the forecasts were not accurate to actual conditions. While PECO remains open to storm damage and outage prediction models, PECO does not rely heavily on them, as they are only as good as the accuracy of the forecast.

### **Penelec**

FirstEnergy outage volume model (OVM) estimates customer outages and outage orders based on historical event data. The OVM is used in conjunction with other tools and decision making when planning for an outage event. Based on the weather forecast issued by FirstEnergy Meteorological Services on February 28, 2018, Penelec anticipated a significant impact to its service territory as the event was predicted to be slow moving with high winds and heavy, wet snow. Penelec ran the OVM on Feb. 28 and March 1, 2018. In both instances, the estimated number of impacted customers and corresponding

estimated outage order volume was low. Because the OVM is based on historical event data, it depends on the history of “like” events in its calculation. Historical data corresponding with a slow-moving storm combined with high winds and heavy, wet snow are minimal, resulting in estimates that may not be realistic. As news events occur, this data is added to the OVM to improve output. Because the OVM results were not realistic, Penelec continued to plan for a significant weather event.

The OVM results were not shared with the Pennsylvania Public Utility Commission’s Bureau of Technical Utility Services.

### **PCLP**

PCLP did not use a prediction model. Prior to the transfer of ownership, ORU had a companywide (NY, NJ, PA) Storm Outage Prediction Model. PCLP will evaluate the need for such a model.

### **PPL**

PPL utilized its storm modeling system prior to and during the event. While this model predicted damage typically associated with a large, reportable storm, it did not predict a “Major Event.” Because a Major Event was not forecasted, the Commission was not supplied with the model predictions.

**QUESTION 38. EDC Best Practices Group Storm Road Closure Process.** Describe how your company incorporated the best practices on storm road closure protocols developed by PECO, specifically regarding coordination with county emergency management on road closure prioritization and removal of wires from trees on roadways.

### **Met-Ed**

Met-Ed utilized FirstEnergy’s road closure process during Riley and Quinn. Tickets were created by the call center based on a form faxed by local EMAs. The tickets were coded as high, medium, or low priority based on the location of the road closure and the volume of traffic. Met-Ed’s Distribution Control Center dispatched line and forestry crews to the locations based on priority identified by the respective EMA. External Affairs Managers provided feedback to the EMAs as needed. Met-Ed completed 288 road closures tickets for Riley and Quinn.

To further support the road closure process, Met-Ed sent a liaison to the emergency operation centers in Bucks, Monroe, and Pike Counties. In Bucks and Monroe Counties, a trouble location was identified and prioritized by the county, hand delivered to the Met-Ed liaison, and forwarded by the liaison to Met-Ed’s Distribution Control Center for follow-up. In Pike County, where the devastation was greatest, the same process was followed. However, the Met-Ed liaison was given a dedicated Met-Ed Distribution System

Operator who had dedicated line and forestry crews at their disposal, with a sole focus on road closures. As it relates to incorporating best practices developed by PECO, PECO presented their road closure process to the PA EDC Best Practices Operations Team during the team's August 2014 meeting. FirstEnergy's road closure procedure was developed following that meeting and incorporated PECO's shared best practice of coordinating with the local EMAs to identify and prioritize inaccessible roads.

### **PECO**

PECO implemented its Road Closure (RC) process at the beginning of the storm activation on Friday, March 2, 2018, and completed RC activities on Saturday, March 10, 2018. Throughout the storm, PECO completed or cleared 620 RC events in the PECO system that were entered by County Emergency Operations Centers and direct contacts from municipalities.

Beginning on March 2, 2018, RC Summary and Detail Reports were sent to pre-designated county email distribution lists and PECO Government Affairs team members. On Wednesday, March 7, PECO suspended email distribution of automated External Detail Reports to ensure the accuracy of "make safe" reporting to counties on jobs completed by non-RC crews. Beginning on March 2, 2018, RC Summary and Detail Reports were sent to pre-designated county email distribution lists and PECO Government Affairs team members. Beginning on Wednesday, March 7 at approximately 18:00 hours, PECO began manually distributing email reports at approximately 2-hour intervals to county email distribution lists and PECO county external affairs managers on completed jobs. These reports continued through Friday March 9 until approximately 18:00 hours, when all RC jobs managed by RC crews were completed. While PECO views the current road closure process as a very solid, accurate process, PECO will look at ways to improve the exactness of "make safe" reporting as part of its after-storm review so there is no question of accuracy in the future.

PECO distributed summary reports of open jobs to county email contact lists periodically from Wednesday, March 7 at 18:00 hours through Friday, March 9, 2018.

### **Penelec**

Penelec utilized FirstEnergy's road closure process during Riley. Tickets were created by the call center based on a form faxed by local EMAs. The tickets were coded as high, medium, or low priority based on the location of the road closure and the volume of traffic. Penelec's Distribution Control Center dispatched line and forestry crews to locations based on priority identified by the respective EMA. External Affairs Managers provided feedback to the EMAs as needed. Penelec completed 141 road closure tickets for Riley. As it relates to incorporating best practices developed by PECO, PECO

presented their road closure process to the PA EDC Best Practices Operations Team during the team's August 2014 meeting. FirstEnergy's road closure procedure was developed following that meeting and incorporated PECO's shared best practice of coordinating with the local EMAs to identify and prioritize inaccessible roads.

### **PCLP**

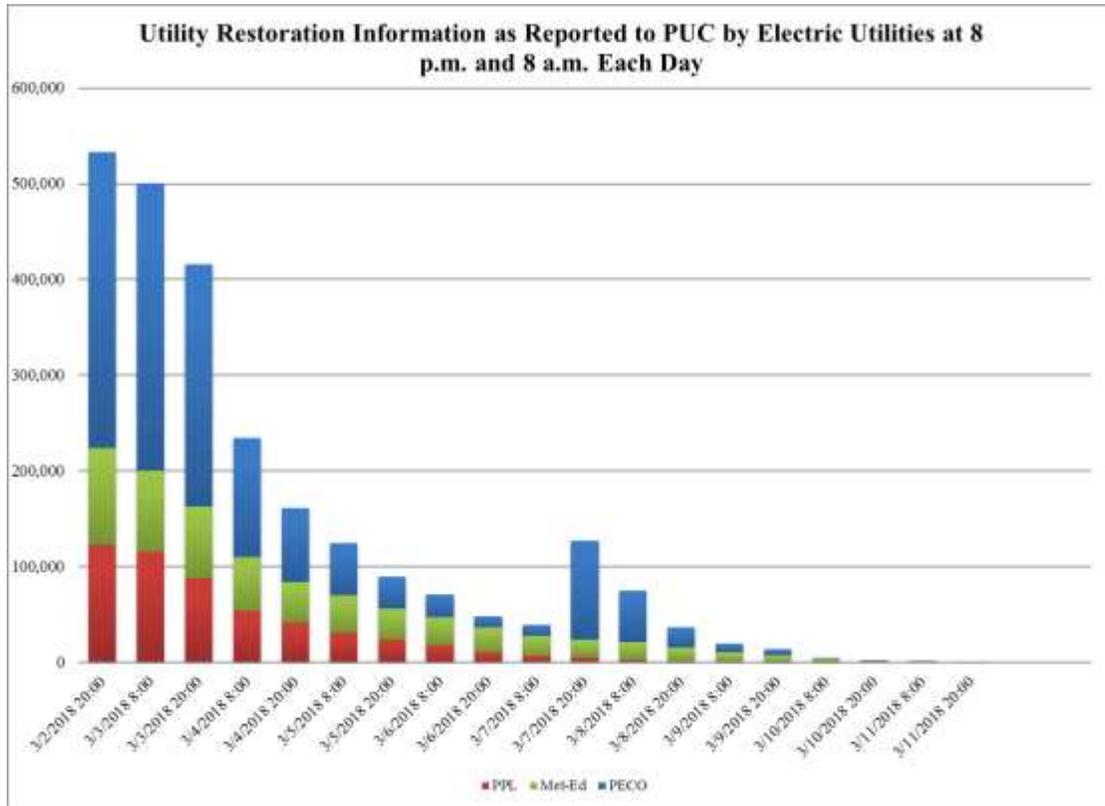
PennDOT notified local officials of road closures through emails, texting, and direct calls. Due to Damage Assessment being performed immediately at the onset of the storm, areas with blocked poles or conductors were identified. Inaccessible roads due to snow depth were also communicated to the appropriate "road Master."

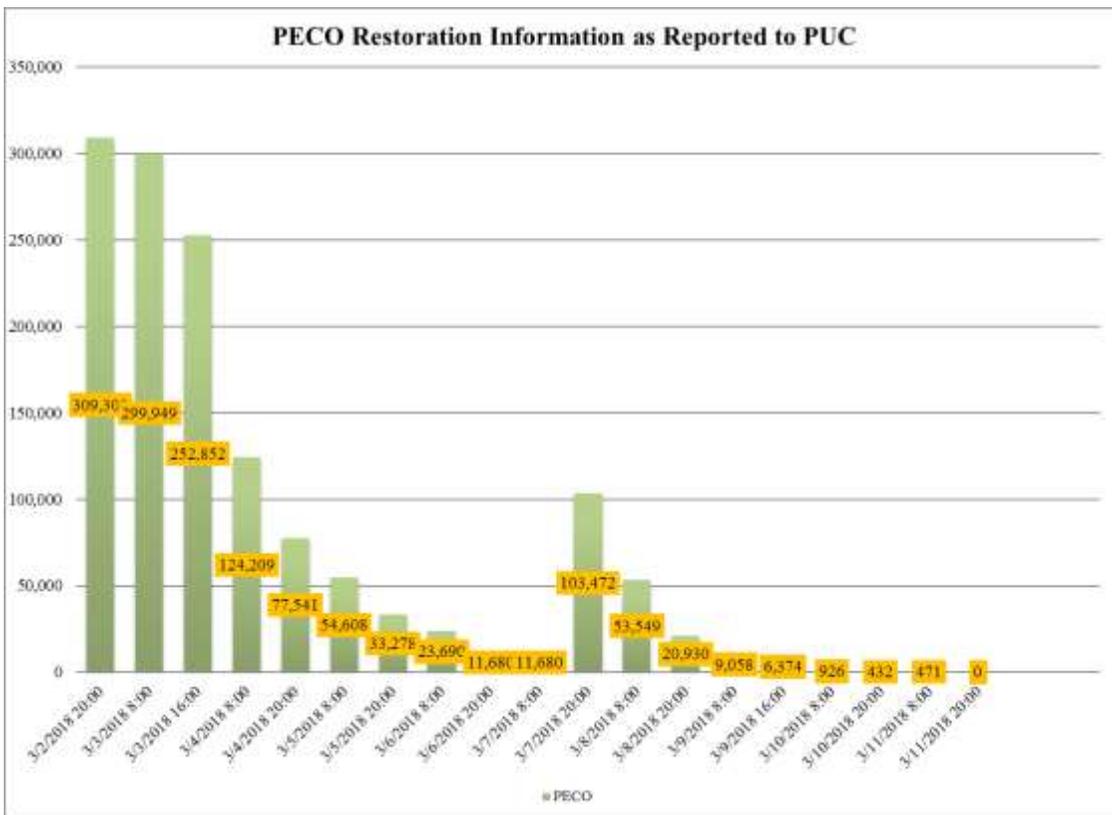
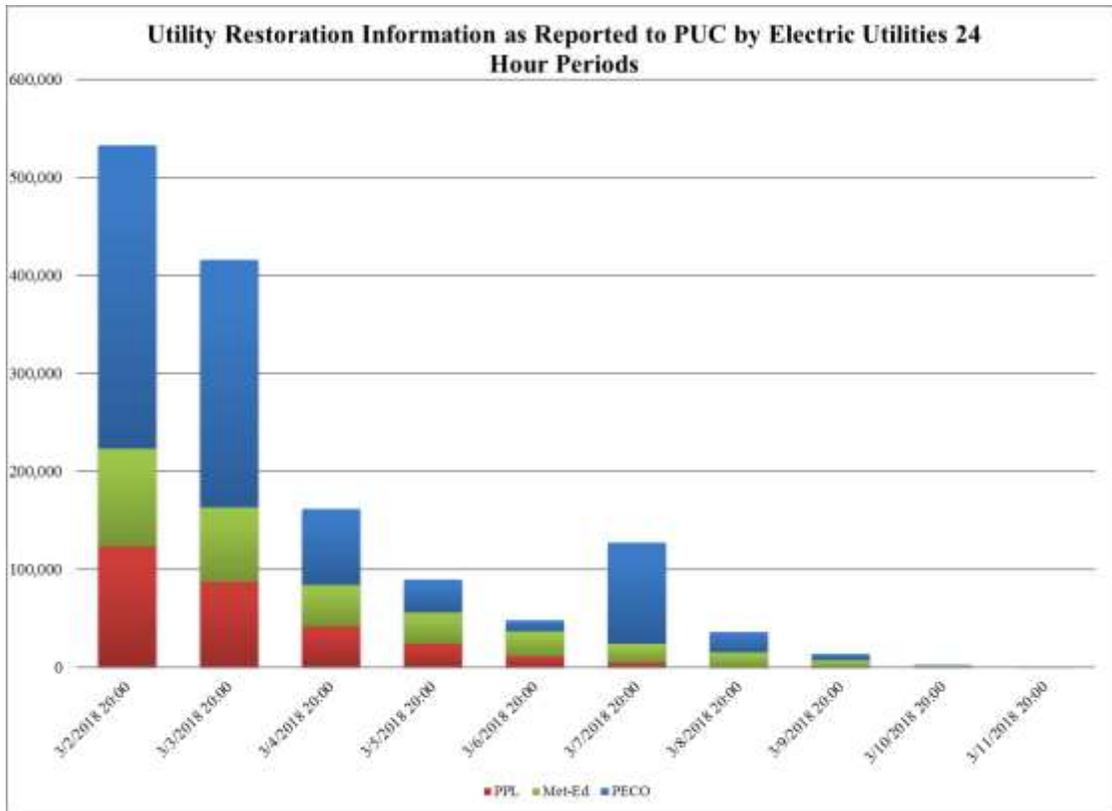
### **PPL**

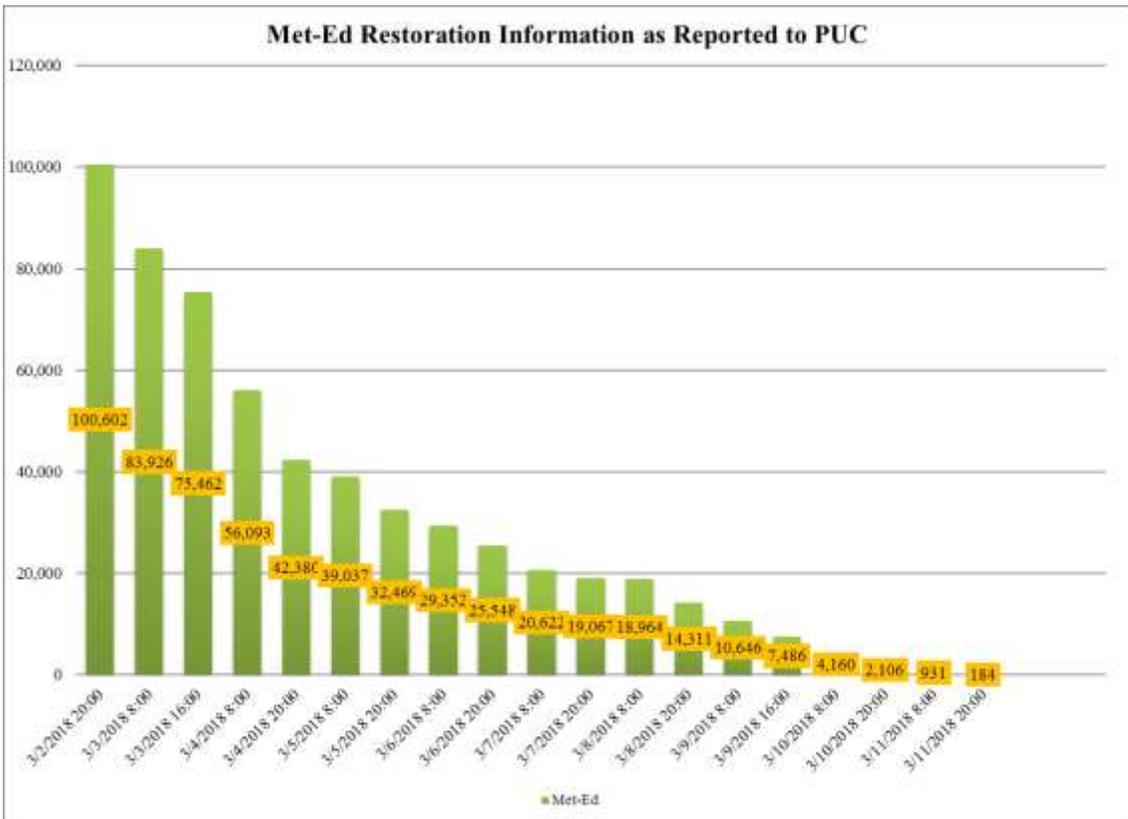
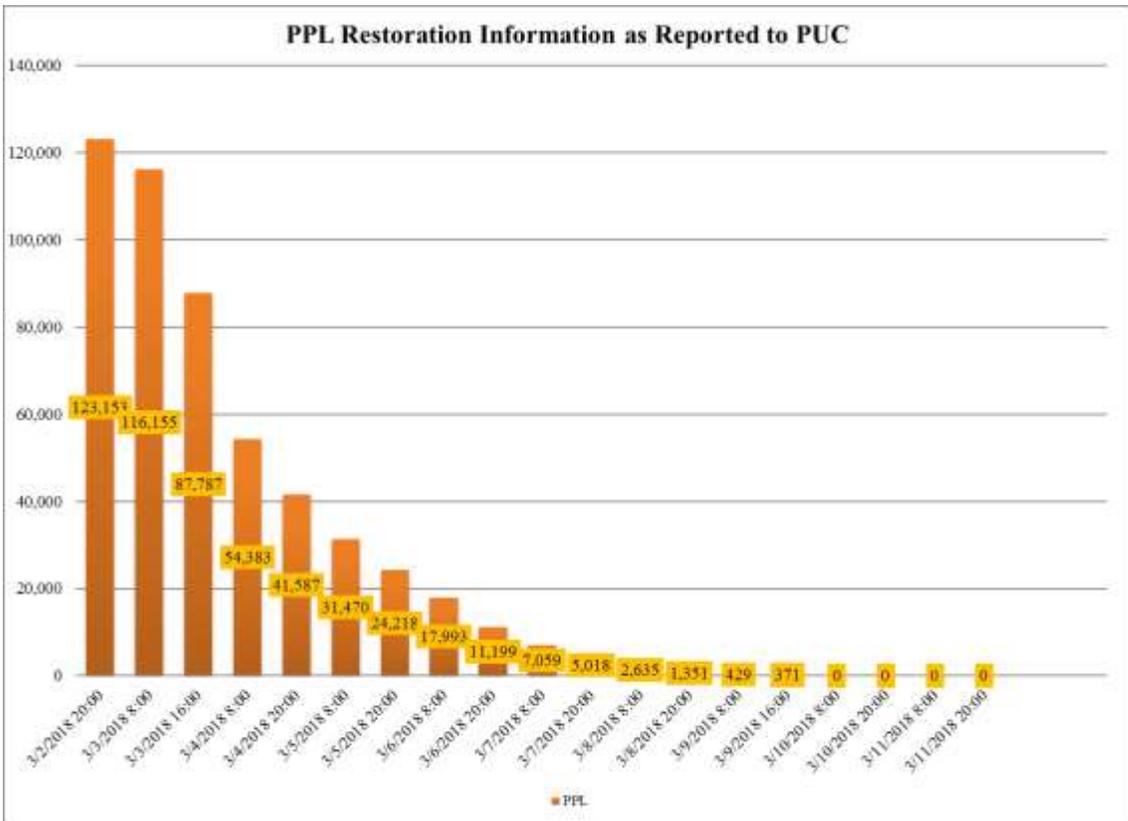
PPL's road closure process was activated for this event, which focuses on clearing roadways of downed PPL Electric facilities, keeping the public safe, and relieving external emergency response personnel of guarding the location.

Road closure orders are either entered directly into the PPL system by 911 centers or entered by PPL employees upon initiation by phone calls from 911 centers. Orders are prioritized, and crews are dispatched to assess and clear the situation. If the closure cannot be cleared by the initial crew, a traffic control crew is dispatched to relieve public emergency responders until an electrical crew arrives.

**APPENDIX C:  
OUTAGE RESTORATION PROGRESS AS REPORTED TO PUC BY EDCS DURING  
RESTORATION**







**APPENDIX D:  
FORECAST AND ACTUAL IMPACTS OF RILEY & QUINN<sup>16</sup>**

**FORECAST**

PEMA Weather Briefing February 27, 2018

**5 Day Rainfall Forecast**

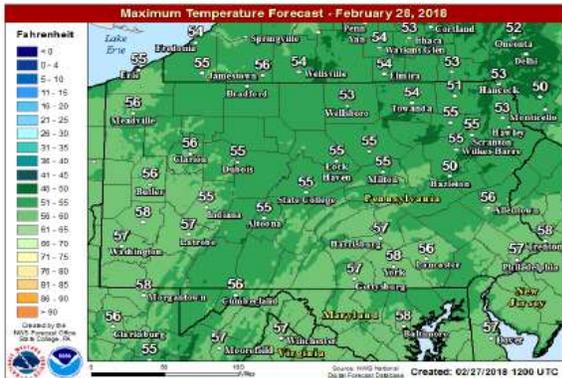


WPC 5-DAY O/P  
ISSUED: 0630Z TUE FEB 27 2018  
VALID: 12Z TUE FEB 27 2018  
TBD: 12Z SUN MAR 04 2018  
FORECASTER: WPC  
DOC: NOAA/NWS/NCEP/WPC

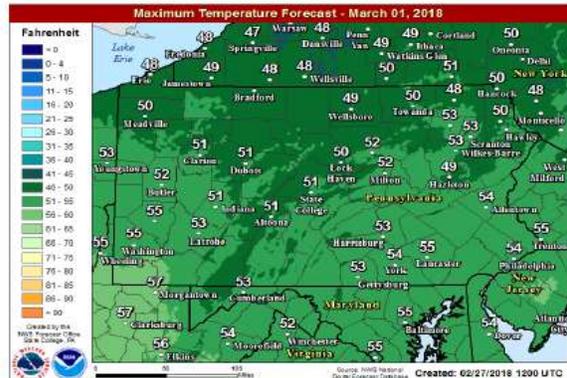
Click the image for a current view.



**Temperature Forecast**



**High Wednesday  
M-U50s**



**High Thursday  
N50-M50s**

Click this link for current maps.



<sup>16</sup> Information provided by PEMA's Meteorologist, Jeff Jumper, unless otherwise noted.

## Outlook

**Today:** Increasing clouds. Mild. Stray shower possible north or west.  
**Highs:** Middle 50s north to Lower 60s south

**Tonight:** Mostly cloudy. Increasing chances for rain by daybreak.  
**Lows:** Upper 30s NE to Middle 40s SW

**Thursday:** Overcast. Rain likely. Still mild.  
**Highs:** Near 50° north to Middle 50s south



## Extended Outlook

**Friday:** Mostly cloudy with rain showers south with a switch to snow north, highest accumulations in NEPA elevations. Colder with strong NW winds developing.  
**Wind:** NW 15-25mph, gusting 30-45mph  
**Highs:** Middle 30s NW to Middle 40s SE

**Saturday:** Partly to mostly cloudy. Windy day. Leftover snow showers NEPA.  
**Highs:** Middle 30s NW to Upper 40s SE

**Sunday:** Partly cloudy and a touch above average.  
**Highs:** Upper 30s north to Upper 40s south

**Next Week:** Near to slightly above average. A few chances for rain/snow possible.



# Current Watches, Warnings, Advisories

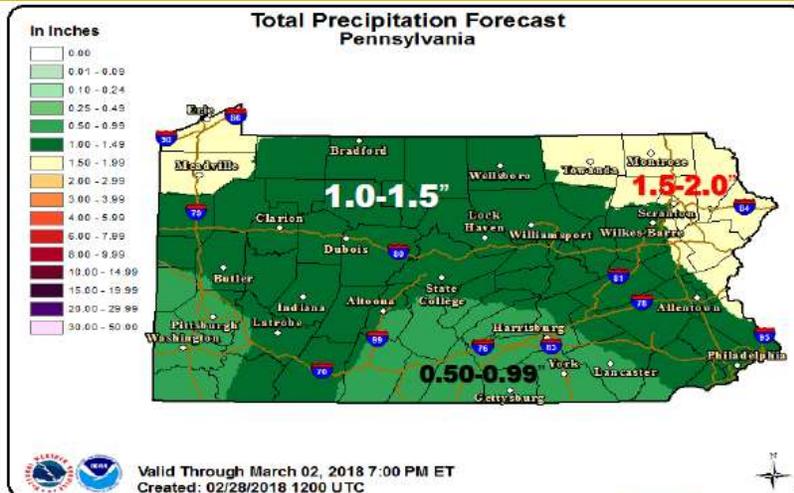


Graphic Created  
February 28th, 2018  
11:50 AM EST

Click the image for a current view.



# PA 2.5 Day Rainfall



Click the image for a current view.



# Winter Weather Summary Sheet

## Friday, March 2, 2018

**Begin:** Thursday night

**End:** Friday late

**Heaviest:** Friday mid-morning  
into early evening

**Location:** Northern PA

**Type:** Sticky Wet Snow

**Hazards:**

Reduced Visibility

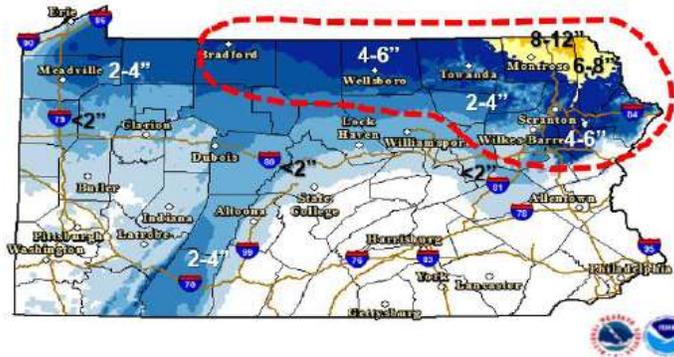
Treacherous Travel

Isolated Power Outages

Strong Winds

(NW 15-25mph, Gusts to 45mph)

Switchover mainly Friday morning. Highly uncertain on amounts.



**Confidence:** Low Medium High Very High



pennsylvania  
EMERGENCY MANAGEMENT AGENCY

## PEMA Weather Briefing March 1, 2018

# Outlook

**Today:** Overcast & mild. Rains spreads east during the day, heavy at times.

**Highs:** Near 50° north to Middle 50s south

**Tonight:** Overcast. Rain likely early, then a transition to snow begins from west to east, except for SC/SE PA. Heavier snow begins NEPA. Turning windy.

**Lows:** Near 30° NW to Near 40° SE

**Friday:** Overcast with periods of heavy snow northern tier and NEPA, highest accumulations in NEPA elevations. Rain/snow showers elsewhere. Very strong, potentially damaging NW winds likely.

**Wind:** NW 20-35mph, gusting 40-60mph

**Highs:** Middle 30s NW to Middle 40s SE



pennsylvania  
EMERGENCY MANAGEMENT AGENCY

# Current Watches, Warnings, Advisories

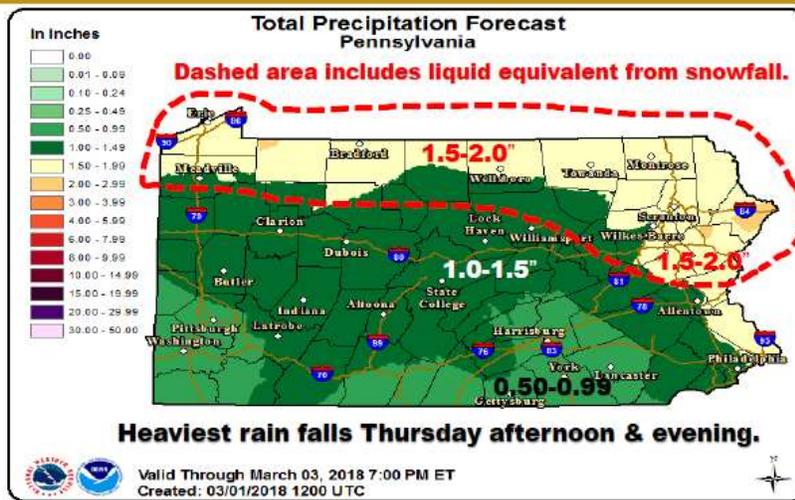


Graphic Created  
March 1st, 2018  
1:05 AM EST

Click the image for a current view.



# PA 2.5 Day Rainfall



Click the image for a current view.



# Winter Weather Summary Sheet

## Friday, March 2, 2018

**Begin:** Thursday night

**End:** Friday night

**Heaviest:** Friday morning into late afternoon  
Generally 1-2"/hr rates

**Location:** North/NEPA

**Type:** Wet Snow

**Hazards:**

**Snow:**

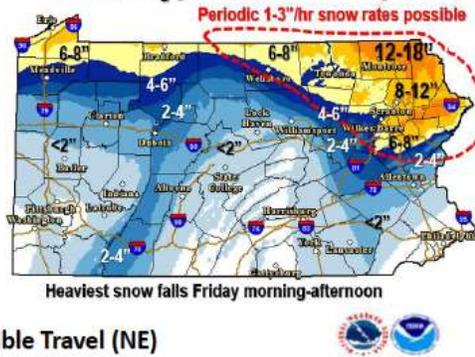
Reduced Visibility

Dangerous/Nearly Impossible Travel (NE)

**Strong Winds (NW 20-35mph, Gusts to 60mph):**

Power/Utility Outages/Downed Trees/Property Damage

Difficult travel for high profile vehicles



### Damaging Wind Gusts 40-60mph



**Confidence:** Low Medium High Very High



# PA 2.5 Day Snowfall Forecast



Click the image for a current view.



## Max Wind Gust Forecast - Friday



Sustained: NW 20-35mph  
Gust: 40-60mph



### PEMA Weather Briefing March 2, 2018

## Outlook

**Today:** Overcast with periods of heavy snow in NEPA, highest accumulations in elevations. Lighter rain/snow showers elsewhere. Very strong, potentially damaging NW winds likely.

Wind: NW 20-35mph, gusting 40-70mph along & east of Laurels

Highs: Lower 30s north to Lower 40s SE

**Tonight:** Mostly cloudy. Snow showers and wind taper.

Lows: Lower 20s NW to Middle 30s SE

**Saturday:** Partly to mostly cloudy. Windy (NW 15-25mph, gust to 35mph). Leftover snow showers northern PA.

Highs: Middle 30s NW to Middle 40s SE

**Sunday:** Mostly sunny, dry and quiet. Near average.

Highs: Upper 30s north to Middle 40s south



# Current Watches, Warnings, Advisories



Graphic Created  
 March 2nd, 2018  
 7:45 AM EST

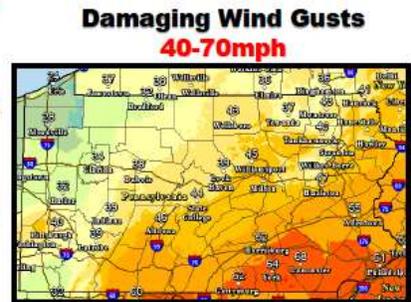
Click the image for a current view.



# Winter Weather Summary Sheet

## Friday, March 2, 2018

- End:** Friday night
- Heaviest:** Now-Late Aftn  
*Generally 1-2"+/hr rates NEPA*
- Location:** NEPA
- Type:** Wet to Dry Snow
- Hazards:**
- Snow:**

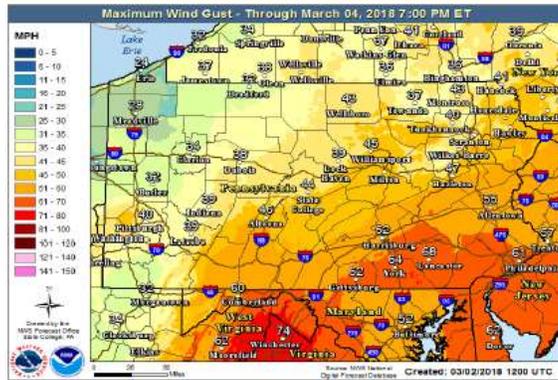


- Reduced Visibility/Blowing Snow
- Dangerous/Nearly Impossible Travel (NEPA)
- Strong Winds (NW 20-35mph, Gusts to 70mph):**
- Power/Utility Outages/Downed Trees/Property Damage
- Difficult travel for high profile vehicles

**Confidence:** Low Medium High **Very High**



# Max Wind Gust Forecast - Friday



**Sustained: NW 20-35mph**  
**Strongest Gusts: 45-70mph**

*Peak winds during the daylight hours, mainly East of Laurel highlands*



# PA 2.5 Day Snowfall Forecast

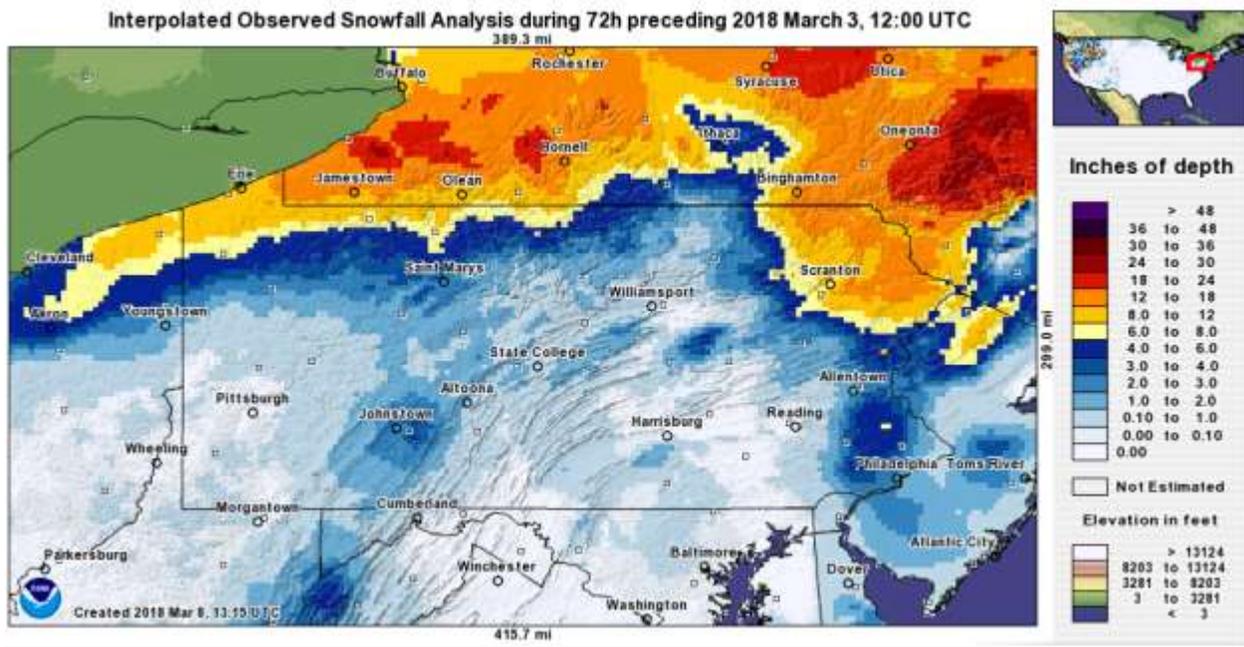


Click the image for a current view.



## ACTUAL IMPACTS

### Snowfall Analysis for March 2, 2018 Event



### National Weather Prediction Center Storm Summary<sup>17</sup>

STORM SUMMARY NUMBER 5 FOR GREAT LAKES TO NEW ENGLAND WINTER STORM WITH COASTAL WIND AND RAIN  
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD  
1000 PM EST FRI MAR 02 2018

...AN INTENSE LOW PRESSURE SYSTEM CONTINUES TO SPIN OFF LONG ISLAND AS HEAVY WET SNOW FALLS ACROSS THE CATSKILLS INTO EASTERN PENNSYLVANIA DOWN INTO SOUTHERN NEW JERSEY. MODERATE TO HEAVY RAIN...HIGH WINDS...AND STORM SURGES CONTINUE TO IMPACT COASTAL NEW ENGLAND...

BLIZZARD WARNINGS ARE NOW IN EFFECT FROM THE CATSKILLS IN UPSTATE NEW YORK DOWN INTO NORTHEASTERN PENNSYLVANIA.

WINTER STORM WARNINGS AND WINTER WEATHER ADVISORIES ARE IN EFFECT FROM NORTHERN PENNSYLVANIA AND NORTHWESTERN NEW JERSEY NORTHWARD ACROSS MUCH OF UPSTATE NEW YORK INTO CENTRAL NEW ENGLAND

HIGH WIND WARNINGS AND WIND ADVISORIES ARE IN EFFECT FOR ALL OF THE MID-ATLANTIC REGION INCLUDING THE APPALACHIANS NORTHWARD TO SOUTHERN NEW ENGLAND.

FOR A DETAILED GRAPHICAL DEPICTION OF THE LATEST WATCHES...WARNINGS AND ADVISORIES...PLEASE SEE [WWW.WEATHER.GOV](http://WWW.WEATHER.GOV)

<sup>17</sup> The full early March winter storm summaries are available here:  
[https://www.wpc.ncep.noaa.gov/storm\\_summaries/storm10/storm10\\_archive.shtml](https://www.wpc.ncep.noaa.gov/storm_summaries/storm10/storm10_archive.shtml).

AT 900 PM EST.. A SURFACE LOW PRESSURE SYSTEM WITH AN ESTIMATED CENTRAL PRESSURE OF 977 MB...28.79 INCHES...WAS ABOUT 200 MILES SOUTHEAST OF LONG ISLAND NEW YORK. SURFACE OBSERVATIONS AND DOPPLER RADAR INDICATED THAT A BAND OF HEAVY SNOW CONTINUED TO FALL FROM THE CATSKILLS INTO EASTERN PENNSYLVANIA DOWN INTO DELAWARE AND EASTERN MARYLAND. ACROSS COASTAL NEW ENGLAND...BANDS OF MODERATE TO HEAVY RAIN CONTINUED TO ROTATE ONSHORE WITH A MIX OF SNOW REPORTING IN NORTHERN MASSACHUSETTS...WITH SUSTAINING WINDS UP TO 40 MPH AND GUSTS OVER 60 MPH. ACROSS THE MID-ATLANTIC REGION...NORTHWESTERLY WINDS GUSTING TO 50 AND 60 MPH WERE COMMON.

...SELECTED STORM TOTAL SNOWFALL IN INCHES FROM 700 AM EST THU MAR 01 THROUGH 900 PM EST FRI MAR 02...

...MASSACHUSETTS...

PLAINFIELD	12.0
SAVOY	10.0
ROWE	9.6
STOCKBRIDGE	8.5
EAST HAWLEY	6.7
HEATH	6.1

...NEW JERSEY...

HIGH POINT	13.5
HIGHLAND LAKES	13.2
VERNON	11.0
MONTAGUE	10.2
BRANCHVILLE	9.5
SCHOOLEYS MOUNTAIN	9.0
GREEN POND	8.7
WEST MILFORD	8.3
WANTAGE	7.5
JEFFERSON	7.0
STOCKHOLM	7.0

...NEW YORK...

RICHMONDVILLE	37.5
JEFFERSON	34.5
GILBOA	30.0
SCHOHARIE	30.0
AMSTERDAM	29.8
DUANESBURG	26.0
GLEN	26.0
WEST KILL	26.0
WINDHAM	26.0
KNOX	24.5
HOBART	24.0
WYOMING	24.0
FORESTVILLE	22.0
ONEIDA	20.0
BUFFALO	12.0

...PENNSYLVANIA...

COOLBAUGH	22.5
TOBYHANNA	20.0
BLOOMING GROVE	12.0
NORTH HONESDALE	10.0

THOMPSON	9.5
PHILADELPHIA	2.5

...VERMONT...

WOODFORD	14.0
LANDGROVE	13.2
PAWLET	7.0
CHESTER	6.0

...SELECTED PRELIMINARY STORM TOTAL RAINFALL IN INCHES FROM 700 AM EST THU MAR 01 THROUGH 900 PM EST FRI MAR 02...

...CONNECTICUT...

FENWICK	3.32
JEWETT CITY	3.28
MIDDLETOWN	3.28
FAIRFIELD	3.27
THOMPSON	2.80

...MASSACHUSETTS...

EAST BRIDGEWATER	5.74
RANDOLPH	3.88
EAST MILTON	2.92
MARION	2.90
TAUNTON	2.90
NORTH WEYMOUTH	2.62
MILLIS	2.00
QUINCY	2.00

...NEW YORK...

WEST HILLS	3.92
LAKE GROVE	3.44
OAKDALE	3.43
SMITHTOWN	3.40
ISLIP	3.34
EAST MASSAPEQUA	3.32
UPTON	3.14
HEWLETT	3.00
HICKSVILLE	2.83
TOPT HILL	2.82
FREDONIA 0.8 WNW	2.55
BAY SHORE 0.5 ESE	2.48
WEST ISLIP 0.6 SW	2.39
COPIAGUE 0.4 ENE	2.32
FARMINGVILLE 0.5 W	2.31
CENTRAL PARK	2.24

...PENNSYLVANIA...

TITUSVILLE 6.3 SW	2.35
LEEPER 0.9 WSW	2.23
SANDY LAKE 1.8 ENE	2.12
TIONESTA 7.3 SSE	2.08

...RHODE ISLAND...

NEWPORT	2.61
EAST PROVIDENCE	2.60

...SELECTED PEAK WIND GUSTS IN MILES PER HOUR EARLIER IN THE

EVENT...

...CONNECTICUT...

NEW LONDON	69	
BRIDGEPORT	62	
NEW HAVEN	49	

...WASHINGTON DC...

AMERICAN UNIVERSITY	66	
CATHOLIC UNIVERSITY	66	
WASHINGTON	66	
SILVER SPRING 1 SSE	64	
ADAMS MORGAN 1 E	61	
GEORGETOWN 1 NNE	58	
THE MALL 1 S	58	
US CAPITOL 1 S	58	

...DELAWARE...

LEWES NOS	66	
DOVER	62	
MIDDLETOWN	58	
WILMINGTON NEW CASTLE		58
GREENWOOD	54	
BLACKBIRD	52	
REDDEN	49	
SUSSEX COUNTY ARPT		49
GEORGETOWN	47	
MILTON	46	
SEAFORD	46	
TOWNSEND	46	

...GEORGIA...

MOUNTAIN CITY 3 ESE	49	
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...KENTUCKY...

LEXINGTON/BLEUGRASS ARPT	48	
FRANKFORT/CAPITAL CITY ARPT	44	

...MASSACHUSETTS...

BARNSTABLE	93	
EAST FALMOUTH	92	
WELLFLEET	91	
NANTUCKET	90	
OAK BLUFFS	88	
WOODS HOLE	88	
SCITUATE	80	
VINEYARD HAVEN		75
EDGARTOWN	74	
MARSTON MILLS	74	
BOSTON	70	
CHARLESTOWN	70	
LOGAN AIRPORT	70	
MASHAPEE	69	
MARTHAS VINEYARD		66

...MARYLAND...

BALLENGER CREEK 2 NW		71
COBB ISLAND 2 SE	69	

GAITHERSBURG	69	
PATUXENT RIVER	69	
SABILLASVILLE 4 SSW	68	
ANDREWS AFB 1 N	67	
ANNAPOLIS - US NAVAL ACADEMY		64
OCEAN CITY MUNICIPAL ARPT	62	
BALTIMORE-WASHINGTON INTL ARPT		61
HAGERSTOWN REGIONAL	61	
GARRETT AIRPORT	46	
...NORTH CAROLINA...		
ASHEVILLE REGIONAL ARPT		58
ASHFORD 3 S	55	
CHINA GROVE 2 NW	55	
JEFFERSON/ASHE COUNTY ARPT		55
BEECH MOUNTAIN	52	
BOOMER 3 ESE	51	
WATAUGA COUNTY HOSPITAL HELIPORT		50
SALUDA 2 SSW	48	
COLUMBUS 3 ESE	45	
FLETCHER 2 E	44	
ELIZABETH CITY CGAS		41
WOODLAWN 1 S	41	
...NEW JERSEY...		
CAPE MAY	71	
DENNISVILLE	71	
LEBANON	71	
SOUTH PLAINFIELD	65	
WASHINGTON TWP	65	
HARVEY CEDARS	62	
LAWRENCEVILLE	62	
ATLANTIC CITY INTL ARPT		61
BRANDYWINE SHOAL NOS		61
FORTESQUE	60	
MCGUIRE AFB	51	
...NEW YORK...		
BAYVILLE	78	
MIDDLE ISLAND	78	
EATONS NECK	69	
JFK AIRPORT	67	
LARCHMONT HARBOR		66
JONES BEACH	64	
WHITE PLAIN	63	
GREAT GULL ISLAND		60
NAPEAGUE	52	
ROCHESTER GREATER INTL ARPT		43
...OHIO...		
ELYRIA/LORAIN COUNTY ARPT		51
CLEVELAND/BURKE ARPT	48	
COLUMBUS/OHIO STATE UNIV ARPT		48
YOUNGSTOWN-WARREN RGNL ARPT		48
MARION	45	
AKRON-CANTON ARPT	44	
CINCINNATI/NORTHERN KY INTL ARPT		43

...PENNSYLVANIA...

NORTHEAST PHILADELPHIA	62
BUSHKILL CENTER	60
LEHIGH VALLEY INTL ARPT	60
POCONO MOUNTAINS	60
WEST GROVE	60
FLEETWOOD	59
JOHNSTOWN/CAMBRIA COUNTY ARPT	56
PITTSBURGH INTERNATIONAL ARPT	56
ERIE INTL ARPT	54

...RHODE ISLAND...

LITTLE COMPTON	83
BLOCK ISLAND	71
GREEN ARPT	64
PROVIDENCE	64
NEWPORT ARPT	61
WESTERLY ARPT	56
PRUDENCE ISLAND	53
NORTH PROVIDENCE	51

...SOUTH CAROLINA...

TRYON 3 SW	55
TUXEDO 4 S	49

...VIRGINIA...

CHESAPEAKE LIGHT TOWER	79
DAHLGREN 3 NE	75
WASHINGTON/DULLES INTL ARPT	71
CHINCOTEAGUE 1 WSW	70
SLATE MILLS	70
SWIFT RUN 2 ESE	70
STANARDSVILLE	69
AMICUS	64
WALLOPS ISLAND	64
QUANTICO MARINE CORP	63
ROANOKE	62
RONALD REAGAN WASHINGTON ARPT	62
LEESBURG EXECUTIVE ARPT	61
WILLIAMSBURG	55
BLACKSBURG	49
NORFOLK	49

...WEST VIRGINIA...

BRUSHY RUN	65
MARTINSBURG	58
CHARLESTON	55
CANAAN HEIGHTS	52
GRANT COUNTY ARPT	50
MARTINSBURG/WEST VA RGNL ARPT	50
ELKINS/RANDOLPH CO ARPT	49
CLARKSBURG/BENEDUM ARPT	47
BUCKHANNON	46
BECKLEY/RALEIGH COUNTY ARPT	44

...SELECTED STORM TOTAL SNOWFALL IN INCHES WHERE THE EVENT HAS ENDED...

...MICHIGAN...  
WIXOM 7.4  
ANN ARBOR 6.1  
CLARKSON 6.0  
MUNITH 6.0

THE INTENSE LOW PRESSURE SYSTEM IS EXPECTED TO SPIN JUST OFF SOUTHERN NEW ENGLAND COAST THROUGH TONIGHT AND CONTINUE TO BRING HIGH WINDS...HEAVY RAIN...AND STORM SURGE TO THE IMMEDIATE COAST AS MODERATE TO HEAVY SNOW CONTINUES OVER NORTHERN NEW YORK AND PARTS OF VERMONT AND AS FAR SOUTH AS SOUTHERN NEW JERSEY. ADDITIONAL RAINFALL AMOUNTS ALONG COASTAL MASSACHUSETTS CAN EXPECT UPWARDS OF 1 INCH...WITH STORM TOTALS EXPECTED TO BE UP TO 5 INCHES. SNOWFALL TOTALS OF 10 TO 12 INCHES...WITH HIGHER AMOUNTS UP TO 30 INCHES ARE EXPECTED FROM WESTERN NEW YORK INTO THE CATSKILLS AND POSSIBLY DOWN INTO EASTERN PENNSYLVANIA. THE INTENSE STORM SHOULD BEGIN TO ACCELERATE TOWARD THE SOUTHEAST AWAY FROM THE NEW ENGLAND COAST TONIGHT INTO SATURDAY. WIND GUSTS CAN INITIALLY REACH 80 MPH NEAR THE COAST BUT WILL BEGIN TO SUBSIDE LATER TONIGHT AS THE STORM SLOWLY MOVES OUT TO SEA.

**Maximum Wind Gusts reported for March 2, 2018 event by National Weather Service (NWS) Forecast office**

**NWS Mount Holly**

...Berks County...

Fleetwood	59	321 PM	3/02	CWOP
Reading Regional Air	58	238 PM	3/02	ASOS
Lenhartsville	54	239 PM	3/02	CWOP

...Bucks County...

Perkasie	51	237 PM	3/02	NONFEDAWOS
Nockamixon	49	323 PM	3/02	WXFLOW
Yardley	48	332 PM	3/02	CWOP
Newton	48	455 PM	3/02	CWOP
Doylestown Airport	47	158 PM	3/02	ASOS

...Chester County...

West Grove	60	305 PM	3/02	DEOS
Coatesville	53	355 PM	3/02	AWOS
Marsh Creek	52	651 PM	3/02	WXFLOW
4 NW Ladenberg	50	1245 PM	3/02	CWOP

...Delaware County...

Newtown Square E 56 721 PM 3/02 CWOP

...Lehigh County...

Lehigh Valley Intl A 60 520 PM 3/02 ASOS

Queen City 51 635 PM 3/02 AWOS

4 SE Claussville 46 155 PM 3/02 CWOP

...Monroe County...

Pocono Mountains Mun 60 130 PM 3/02 ASOS

Pocono Pines 48 540 PM 3/02 CWOP

...Montgomery County...

Pottstown Limerick A 46 512 PM 3/02 ASOS

...Northampton County...

Bushkill Center 60 1152 AM 3/02 Trained Spotter

Cherry Hill 58 800 PM 3/02 Trained Spotter

Beersville 50 115 PM 3/02 Trained Spotter

Danielsville 47 213 PM 3/02 CWOP

...Philadelphia County...

Northeast Philadelph 62 313 PM 3/02 ASOS

Philadelphia Intl Ai 59 1024 PM 3/02 ASOS

**NWS State College**

...Adams County...

1 S Cashtown 60 800 AM 3/02 Co-Op Observer

1 WSW Carroll Valley 58 401 AM 3/02 CWOP

Cashtown 47 409 AM 3/02 CWOP

...Bedford County...

Everett	51	1155 AM	3/02	CWOP
Bedford Airport	51	955 AM	3/02	AWOS
1 ENE Queen	45	959 AM	3/02	CWOP

...Blair County...

Altoona Airport	53	223 PM	3/02	ASOS
Blair Helibase	46	216 PM	3/02	RAWS

...Cambria County...

Johnstown Airport	56	145 AM	3/02	ASOS
2 N South Fork	44	1225 AM	3/02	CWOP
3 S Coalport	40	334 AM	3/02	CWOP

...Centre County...

Nws State College	45	248 PM	3/02	NWS Office
2 NNE State College	45	250 PM	3/02	CWOP
2 E Port Matilda	41	101 PM	3/02	CWOP
University Park Arpt	40	653 AM	3/02	AWOS

...Clearfield County...

Clearfield Airport	43	1109 AM	3/02	ASOS
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...Clinton County...

Coffin Rock	40	616 AM	3/02	RAWS
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...Cumberland County...

Carlisle Springs	42	147 PM	3/02	CWOP
New Cumberland	42	139 PM	3/02	CWOP
3 SW Hogestown	41	241 PM	3/02	CWOP

...Dauphin County...

Harrisburg Int'l Air	60	249 PM	3/02	ASOS
Rockville	52	1134 AM	3/02	CWOP

1 NNE Harrisburg	50	311 PM	3/02	CWOP
Manda Gap	45	218 PM	3/02	RAWS
Harrisburg	43	106 PM	3/02	PEMA
...Franklin County...				
1 WNW Rouzerville	49	1102 AM	3/02	CWOP
Scotland	49	1035 AM	3/02	CWOP
3 WNW Mont Alto	46	150 PM	3/02	CWOP
2 NNE Rouzerville	42	1245 PM	3/02	CWOP
1 SSE Marion	40	206 PM	3/02	CWOP
...Lancaster County...				
Lancaster Airport	54	1226 PM	3/02	ASOS
3 NW Mount Vernon	53	153 PM	3/02	CWOP
3 SW Quarryville	49	329 PM	3/02	CWOP
East Petersburg	49	122 PM	3/02	CWOP
2 ESE Landisville	49	1127 AM	3/02	CWOP
Ephrata	44	1220 PM	3/02	CWOP
1 ENE Mountville	44	1133 AM	3/02	CWOP
New Holland	41	1036 AM	3/02	CWOP
2 NNE Paradise	40	153 PM	3/02	CWOP
...Lebanon County...				
Muir Airfield Ft. In	53	218 PM	3/02	AWOS
2 WNW Fort Indiantow	52	113 PM	3/02	RAWS
1 ESE Palmyra	50	249 PM	3/02	CWOP
Lawn	41	138 PM	3/02	CWOP
2 SW Kleinfeltersvil	40	1205 PM	3/02	CWOP
...Lycoming County...				
Williamsport Airport	49	1138 AM	3/02	ASOS
...McKean County...				
Bradford Airport	43	1259 PM	3/02	ASOS

...Northumberland County...

Sunbury 42 215 PM 3/02 CWOP

...Perry County...

Big Knob 51 108 PM 3/02 RAWS

3 ESE Shermansdale 43 1110 AM 3/02 CWOP

...Schuylkill County...

1 E Tower City 53 157 PM 3/02 CWOP

...Snyder County...

Penn Valley Airport 45 1104 AM 3/02 ASOS

...Somerset County...

2 NW Wellersburg 54 143 AM 3/02 CWOP

6 NW Somerset 52 953 PM 3/01 CWOP

3 WNW Acosta 48 1210 AM 3/02 CWOP

1 SW Somerset 40 1140 PM 3/01 CWOP

Seven Springs 40 129 PM 3/02 CWOP

...Union County...

Mifflinburg 40 1005 AM 3/02 CWOP

...York County...

Capital City Airport 49 230 PM 3/02 ASOS

1 SW Stonybrook 49 1253 PM 3/02 CWOP

York Airport 49 1248 PM 3/02 ASOS

1 WSW Emigsville 40 144 PM 3/02 CWOP

Weigelstown 40 945 AM 3/02 CWOP

