



COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
COMMONWEALTH KEYSTONE BUILDING
400 NORTH STREET, HARRISBURG, PA 17120

IN REPLY PLEASE
REFER TO OUR FILE

December 30, 2024

Docket No. M-2009-2094773

KIMBERLY A. KLOCK
ASSISTANT GENERAL COUNSEL
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Re: Biennial Inspection, Maintenance, Repair and Replacement Plan for PPL Electric Utilities Corporation (2026-2027) at Docket No. M-2009-2094773

Dear Ms. Klock:

On October 1, 2024, PPL Electric Utilities Corporation (PPL Electric) filed its Biennial Inspection, Maintenance, Repair and Replacement Plan (Plan) with the Pennsylvania Public Utility Commission (Commission), pursuant to 52 Pa. Code § 57.198(a), to be made effective on January 1, 2026. In its Plan, PPL Electric has proposed continuation of previous modifications to its original plan, which will be discussed herein. The Commission's Bureau of Technical Utility Services¹ (TUS Staff) in accordance with 52 Pa. Code § 57.198(h) & (j) delegated authority,² rejects PPL Electric's Plan for the reasons expressed below. TUS Staff directs PPL Electric to file a revised Plan within 30 days of service of this letter that either fully complies with 52 Pa. Code § 57.198(n)(4) and (n)(6), or that proposes an exemption for the minimum visual inspection timeframes which provide for a visual inspection of all distribution overhead lines, overhead distribution transformers and above-ground pad-mount transformers on some reasonable periodic basis.

On November 8, 2024, via Secretarial Letter, TUS Staff sent a data request to PPL Electric requesting more information on condition-based criteria for inspection of overhead lines and associated overhead distribution transformers. On November 22, 2024, PPL Electric responded. On November 26, 2024, via Secretarial Letter, TUS Staff sent a second data request to PPL Electric seeking more information on its Proactive Circuit Analysis process. On December 11, 2024, PPL Electric responded.

¹ The Bureau of Conservation, Economics and Energy Planning was eliminated, and its functions and staff transferred to the Bureau of Technical Utility Services. *See, Implementation of Act 129 of 2008; Organization of Bureaus and Offices*, Final Procedural Order, entered August 11, 2011, at Docket No. M-2008-2071852, at 4.

² 52 Pa. Code § 57.198(h) (relating to Review procedures): Within 90 days of receipt of the plan, the Commission or the Director of the Bureau of Conservation, Economics and Energy Planning (CEEP) will accept or reject the plan in writing. 52 Pa. Code § 57.198(j) (relating to Plan deficiencies): If the plan is rejected, in whole or in part, by the Commission or the Director of CEEP, the EDC will be notified of the plan's deficiencies and directed to submit one of the following: (i) A revised plan, or pertinent parts of the plan, addressing the identified deficiencies.

The Commission's regulation at 52 Pa. Code § 57.198 require EDCs to file, every two years by October 1, a biennial plan for the periodic inspection, maintenance, repair, and replacement of facilities that is designed to meet reliability performance benchmarks and standards set forth in 52 Pa. Code §§ 57.191-57.197. The Commission's Tentative Implementation Order, entered August 13, 2009, identified PPL Electric as one of six EDCs in Compliance Group 2 to initially file their Plan by October 1, 2010, and then every two years thereafter.³ The Plan must cover the two calendar years beginning 15 months after filing and remain in effect for two calendar years thereafter (January 1, 2026, through December 31, 2027).

Plan Consistency

52 Pa. Code § 57.198(b) (relating to plan consistency): The plan must be consistent with the National Electrical Safety Code, Codes and Practices of the Institute of Electrical and Electronic Engineers, Federal Energy Regulatory Commission Regulations, and provisions of the American National Standards Institute, Inc.

TUS Staff finds that PPL Electric's Plan generally complies with 52 Pa. Code § 57.198(b). However, the Plan's overall compliance and achievement of purpose will be discussed *infra*.

Time Frames

52 Pa. Code § 57.198(c) (relating to time frames): The plan must comply with the inspection and maintenance standards in subsection (n). A justification for the inspection and maintenance time frames selected shall be provided, even if the time frame falls within the intervals prescribed in subsection (n). However, an EDC may propose a plan that, for a given standard, uses intervals outside the Commission standard, provided the deviation can be justified by the EDC's unique circumstances or a cost/benefit analysis to support an alternative approach that will still support the level of reliability required by law.

PPL Electric has proposed modifications, discussed *infra*, for the following programs, or parts of programs:

- Pole loading calculations.
- Distribution Overhead Line Inspection Interval.
- Recloser Inspection Interval.
- Distribution Overhead Transformer Inspection Interval.
- Distribution Pad Mounted Transformer Inspection Interval.
- Substation Inspection Interval.

³ See *Inspection, Maintenance, Repair and Replacement Standards for Electric Distribution Companies*, Tentative Implementation Order, Docket No. M-2009-2094773, at 3-4 (the Tentative Implementation Order became final by operation of law on October 15, 2009).

Record Keeping

52 Pa. Code § 57.198(m) (relating to recordkeeping): An EDC shall maintain records of its inspection and maintenance activities sufficient to demonstrate compliance with its distribution facilities inspection, maintenance, repair and replacement programs as required by subsection (n). The records shall be made available to the Commission upon request within 30 days.

Examples of sufficient records include:

- (1) Date-stamped records signed by EDC staff who performed the tasks related to inspection.*
- (2) Maintenance, repair and replacement receipts from independent contractors showing when and what type of inspection, maintenance, repair or replacement work was done.*

TUS Staff Finds that PPL Electric's Plan generally complies with Section 57.198(m).

Vegetation Management

52 Pa. Code § 57.198(n)(1) (relating to inspection and maintenance intervals for vegetation management): The Statewide minimum inspection and treatment cycle for vegetation management is between 4-8 years for distribution facilities. An EDC shall submit a condition-based plan for vegetation management for its distribution system facilities explaining its treatment cycle.

TUS Staff finds that PPL Electric's Plan generally complies with Section 57.198(n)(1).

Pole Inspections

52 Pa. Code § 57.198(n)(2) (relating to inspection and maintenance intervals for pole inspections): Distribution poles shall be inspected at least as often as every 10-12 years except for the new southern yellow pine creosoted utility poles which shall be initially inspected within 25 years, then within 12 years annually after the initial inspection. Pole inspections must include:

- (i) Drill tests at and below ground level,*
- (ii) A shell test.*
- (iii) Visual inspection for holes or evidence of insect infestation.*
- (iv) Visual inspection for evidence of unauthorized backfilling or excavation near the pole.*
- (v) Visual inspection for signs of lightning strikes.*
- (vi) A load calculation.*

The Plan states that PPL Electric will visually inspect distribution wood poles on a 12-year cycle. PPL Electric included a previously approved exemption from performing pole load calculations as part of pole inspections. PPL Electric noted that pole failures are a very small impact on reliability and that the failures that occurred were aggravated by weather conditions and vegetation being blown into lines. PPL Electric stipulated that the risk reduction through a load calculation would be insignificant.

TUS staff agrees with PPL Electric's assertion that the risk reduction through a load calculation would be insignificant. Accordingly, TUS Staff grants PPL Electric's request for an exemption from performing load calculations as part of its pole inspection program. However, TUS Staff directs PPL Electric to conduct subsequent assessments of pole strength prior to attachment of non-company facilities. TUS Staff finds that The Plan, as modified, is consistent with the previously approved Plan and generally complies with Section 57.198(n)(2).

Pole Inspection Failure

52 Pa. Code § 57.198(n)(3) (relating to inspection and maintenance intervals for pole inspection failure): If a pole fails the groundline inspection and shows dangerous conditions that are an immediate risk to public or employee safety or conditions affecting the integrity of the circuit, the pole shall be replaced within 30 days of the date of inspection.

TUS Staff finds that PPL Electric's Plan generally complies with Section 57.198(n)(3).

Distribution Overhead Line Inspections

52 Pa. Code § 57.198(n)(4) (relating to inspection and maintenance intervals for distribution overhead line inspections): Distribution lines shall be inspected by ground patrol a minimum of once every 1-2 years. A visual inspection must include checking for:

- (i) Broken insulators.*
- (ii) Conditions that may adversely affect operation of the overhead transformer.*
- (iii) Other conditions that may adversely affect operation of the overhead distribution line.*

PPL Electric included a previously approved exemption from performing distribution overhead line inspections every two years. PPL Electric's inspection process includes a vehicle-borne infrared inspection of only multi-phase overhead lines adjacent to roadways every two years. All other distribution overhead line inspections are condition-based. Inspections are scheduled under various conditions to include CEMI (customers experiencing multiple interruptions) and WPC (worst-performing circuits), or if warranted based on Proactive Circuit Reviews, and/or if power quality issues are experienced. PPL Electric noted this process is the most cost-effective method to address reliability issues through overhead line inspections.

TUS Staff in its November 8, 2024, data request noted that PPL Electric's condition-based criteria for inspection of overhead lines and associated overhead distribution transformers that are not part of multi-phase overhead lines adjacent to roadways, and PPL Electric's circuit performance criteria for above-ground, pad-mount transfers, appears to allow for some equipment not being visually inspected for several years, if ever. TUS Staff also indicated that such a lack of visual inspection may not comply with the National Electric Safety Code (NESC), specifically NESC Part 2, Section 21, 214.A.2, which requires that electrical lines and equipment be inspected on some periodic basis.

In supplemental information filed with the Commission, PPL Electric noted that it complies with the NESC requirement through several activities including the condition-based

methods described in the Plan and also through its Proactive Circuit Analysis (PCA) process, also described in the Plan. PPL Electric stated that the PCA process, *inter alia*, reviews 25% of its distribution circuits each year with a maximum potential interval of four years for each circuit. PPL Electric stated that the PCA included a desktop review of the entire circuit, followed by a field review, including visual inspection, of specific areas with identified concerns. PPL Electric clarified that the inspection of those specific areas included overhead distribution lines and associated equipment and above-ground pad-mount distribution transformers. PPL Electric also noted other day-to-day operational activities that may trigger visual inspections. Finally, PPL Electric provided information on the number of above-ground pad-mount distribution transformers inspected in the past five- and eight-year periods and provided a list of all PPL Electric overhead circuits and the last date of infrared (IR) inspection and the percentage of the circuit that was visually inspected.

TUS Staff notes that at no point did PPL Electric indicate that all overhead distribution circuits (including overhead distribution transformers) and above-ground pad-mounted distribution transformers are visually inspected on some periodic basis as required by the NESC and 52 Pa. Code § 57.198(n)(4) and (n)(6). The list of overhead circuits inspected provided by PPL Electric indicated that the overwhelming majority of the circuits, as a percentage of the circuit length in feet, were not visually inspected. As noted above, PPL Electric's condition-based and PCA processes do not require nor encompass complete visual inspections of overhead distribution circuits on any periodic basis. In terms of the above-ground pad-mounted distribution transformer inspections, TUS Staff notes that PPL Electric inspected on average 2,900 transformers annually over the past eight years. Assuming PPL Electric was inspecting all such transformers on this same periodic basis, it would take PPL Electric over 31 years to inspect all of the transformers. However, as made clear in the Plan and the processes described by PPL Electric, there is no requirement by PPL Electric to visually inspect above-ground pad-mounted distribution transformers on any periodic basis.

As also detailed in the Plan, PPL Electric utilizes a condition-based (*i.e.*, in contrast to all circuits being trimmed on some periodic basis) inspection and maintenance cycle for vegetation management. Thus, as TUS Staff noted in its data requests, there is a very real potential for some PPL Electric lines and equipment to be uninspected for several years, if ever inspected. TUS Staff finds that the lack of a periodic inspection cycle creates a serious safety concern as overhead distribution circuits and associated equipment can have a direct impact on the public if any person were exposed to electrical current through direct or indirect contact with energized conductors and/or equipment. For example, a circuit could still be operating reliably but all or part of the conductor could be lying far below its required clearance from the ground and within reach of a person walking within the right-of-way.⁴ Another example would be where a conductor has fallen due to contact with vegetation but it has not caused a fault and current continues to flow causing a safety hazard.⁵ An electric circuit and/or equipment could be operating very reliably but still present a very serious danger to the public.

⁴ A recent example where a live line was below required clearance was in the Duquesne Light Company territory, story available here: <https://www.wtae.com/article/duquesne-light-north-park-bicyclist/61214218>.

⁵ See, Docket No. C-2021-3024913.

The Commission is charged with ensuring EDCs provide adequate, efficient, safe, and reasonable service and facilities. 66 Pa.C.S. § 1501. Further, EDCs are required by the Commission to comply with the minimum safety standards established by the NESC and to have Plans that are consistent with the NESC. 52 Pa. Code § 57.28(b) and 57.198(b). While the Commission has previously approved PPL Electric's requested exemptions related to overhead distribution lines,⁶ primarily based on the reliability cost benefit, this does not preclude reconsideration of the matter from a safety aspect.

Therefore, TUS Staff finds that PPL Electric has failed to justify the continuation of the exemption from performing distribution overhead line inspections every two years previously permitted by TUS Staff in accordance with 52 Pa. Code § 57.198(c). While TUS Staff does not take issue with the cost-effectiveness of PPL Electric's condition-based approach for its reliability program, TUS Staff does question the public safety of such an approach. Accordingly, TUS Staff finds that PPL Electric's Plan does not comply with 52 Pa. Code § 57.198(n)(4). However, TUS Staff does not object in principle to PPL Electric utilizing a condition-based approach for distribution overhead line inspections that may extend inspection periodicity beyond once every one to two years, so long as all distribution overhead lines are visually inspected on some reasonable periodic basis.⁷ TUS Staff directs PPL Electric to file a revised Plan that either fully complies with 52 Pa. Code § 57.198(n)(4), or that proposes an exemption for a minimum visual inspection timeframe that provides for a visual inspection of all distribution overhead lines on some reasonable periodic basis.

Inspection Failure

52 Pa. Code § 57.198(n)(5) (relating to inspection and maintenance intervals for inspection failure): If critical maintenance problems are found that affect the integrity of the circuits, they shall be repaired or replaced no later than 30 days from discovery.

TUS Staff finds that PPL Electric's Plan generally complies with Section 57.198(n)(5).

Distribution Transformer Inspections

52 Pa. Code § 57.198(n)(6) (relating to inspection and maintenance intervals for distribution transformer inspection): Overhead distribution transformers shall be visually inspected as part of the distribution line inspection every 1-2 years. Above-ground pad-mounted transformers shall be inspected at least as often as every 5 years and below-ground transformers shall be inspected at least as often as every 8 years. An inspection must include checking for:

- (i) Rust, dents or other evidence of contact.*
- (ii) Leaking oil.*
- (iii) Installation of fences or shrubbery that could adversely affect access to and operation of the transformer.*

⁶ See, Secretarial Letter served December 16, 2022, at Docket No. M-2009-2094773.

⁷ The term "reasonable" can be interpreted narrowly or broadly but as an example, Duquesne Light Company utilizes a five-year inspection cycle for all distribution overhead lines, while PECO Energy Company inspects primary and secondary distribution overhead lines on a two-year and four-year cycle, respectively. See, Docket No. M-2009-2094773.

(iv) *Unauthorized excavation or changes in grade near the transformer.*

PPL Electric included a previously approved exemption from performing overhead distribution transformer, above-ground pad-mounted transformer, and below-ground transformer inspections on a fixed timeframe inspection cycle and instead utilizes a condition-based inspection program. PPL Electric inspects overhead distribution transformers as part of the overhead line inspections and pole inspections, or when conditions warrant. PPL Electric inspects pad-mounted and below-ground transformers when indicated by circuit performance and analysis of actual service interruptions, and when performing Underground Residential Development Cable Testing. PPL Electric avers that the condition-based inspection program is the most cost-effective method to address reliability issues related to distribution transformers. As detailed above, PPL Electric also includes overhead distribution transformers and above-ground pad-mounted distribution transformers in its PCA process.

TUS Staff finds that PPL Electric's condition-based approach presents the very real potential for PPL Electric overhead distribution transformers and above-ground pad-mounted transformers to not be visually inspected for several years, if ever. As noted and consistent with the discussion in the Distribution Overhead Line Inspections section above, TUS Staff finds that overhead distribution transformers and above-ground pad-mounted transformers can have a direct impact on the safety of the public if any person were exposed to electrical current through direct or indirect contact with such energized equipment or other hazards. For example, if the locks were disabled or removed on an above-ground pad-mounted transformer, any member of the public could access the interior and be exposed to live current. Also, if an overhead distribution transformer were to be damaged but still operating, the potential exists for it to leak hot oil or even to burst open and release hot oil with no protection for anyone below the transformer. TUS Staff notes that below-ground transformers are not easily accessible to the public and therefore TUS Staff would not object to a condition-based approach to inspection of those transformers.

Therefore, TUS Staff finds that PPL Electric has failed to justify the continuation of the exemption from performing overhead distribution transformer inspections every two years and above-ground pad-mounted transformers every five years as previously permitted by TUS Staff in accordance with 52 Pa. Code § 57.198(c). Accordingly, TUS Staff finds that PPL Electric's Plan does not comply with 52 Pa. Code § 57.198(n)(6). However, TUS Staff does not object in principle to PPL Electric utilizing a condition-based approach for transformer inspections that may extend inspection periodicity beyond once every one to two years, so long as all overhead and above-ground pad-mount distribution transformers are visually inspected on some reasonable periodic basis.⁸ TUS Staff directs PPL Electric to file a revised Plan that either fully complies with 52 Pa. Code § 57.198(n)(6), or that proposes an exemption for a minimum visual inspection timeframe that provides for a visual inspection of all overhead distribution transformers and above-ground pad-mounted transformers on some reasonable periodic basis.

⁸ As an example, Duquesne Light Company utilizes a five-year inspection cycle for all overhead distribution transformers and an eight-year inspection cycle for above-ground pad-mount distribution transformers. PECO Energy Company also inspects above-ground pad-mount transformers on an eight-year cycle.

Recloser Inspections

52 Pa. Code § 57.198(n)(7) (relating to inspection and maintenance intervals for recloser inspections): Three-phase reclosers shall be inspected on a cycle of 8 years or less. Single-phase reclosers shall be inspected as part of the EDC's individual distribution line inspection plan.

PPL Electric included a previously approved exemption from inspecting three-phase reclosers on a cycle of eight years or less. PPL Electric states that it is engaging in the replacement of oil circuit reclosers (OCRs) with three-phase vacuum circuit reclosers (VCRs) on a condition-based proactive cycle. PPL Electric proposes continuing replacements on a condition-based cycle accounting for the age and condition of the OCRs, so that available funds are used in the most optimal fashion for the continued reliable delivery of electric service.

PPL Electric states that when it began the process of replacing OCRs, there were approximately 5,000 multiphase OCRs on-system. Currently, there are 202 remaining, with an average age of 12 years and an expected lifespan of 30 years.

PPL Electric reports that as it has been replacing older oil reclosing three phased units, reliability has held steady with the number of failed units. In the last 12 months, 13 outages were caused by equipment failure of OCRs and VCRs that were fixed with repairs or replacement consistent with an average of 13 in the past two years. PPL Electric states that 70% of the legacy outage causing equipment has been upgraded to the latest VCR standard aligning with the condition-based replacement strategy in PPL Electric's plan.

For the reasons stated by PPL Electric, TUS Staff grants the request to continue the exemption from performing three-phase recloser inspections on an eight-year inspection cycle or less. TUS Staff finds that the new recloser technology appears to allow continual monitoring of the operational functionality of reclosers and allows three-phase reclosers that have not yet been replaced to be inspected on a 10-year cycle, which corresponds to PPL Electric's 10-year replacement schedule. TUS Staff finds that PPL Electric's Plan is consistent with the previously approved Plan and generally complies with Section 57.198(n)(7).

Substation Inspections

52 Pa. Code § 57.198(n)(8) (relating to inspection and maintenance intervals for substation inspections): Substation equipment, structures and hardware shall be inspected on a cycle of 5 weeks or less.

PPL Electric included a previously approved exemption to reduce the inspection frequency from every five weeks or less to quarterly. PPL Electric averred the basis for this change request is that it upgraded all substations with equipment that will continually monitor critical equipment parameters more cost effectively than manual monthly readings. PPL Electric believes manual quarterly readings would be sufficient to ensure substation reliability performance.

For the reasons stated by PPL Electric, TUS Staff grants PPL Electric's request to continue the exemption from performing substation inspections on a cycle of five weeks or less. TUS Staff directs PPL Electric to continue to perform quarterly in-person substation inspections. TUS Staff finds that PPL Electric's Plan is consistent with the previously approved Plan and complies with Section 57.198(n)(8).

Conclusion

Upon review of PPL Electric's Plan filed on October 1, 2024, TUS Staff finds that implementation of the submitted Plan is not consistent with 52 Pa. Code § 57.198(b) and does not comply with 52 Pa. Code § 57.198(n)(4) and (n)(6). As noted above, the Plan must be consistent with the NESC. Specifically, as discussed above, TUS Staff finds that PPL Electric has failed to justify the continuation of the exemptions for its distribution overhead line, overhead distribution transformer, and above-ground pad-mounted distribution transformer inspection requirements.⁹ Accordingly, TUS Staff rejects PPL Electric's Plan.

Pursuant to 52 Pa. Code § 57.198(j)(i), TUS Staff directs PPL Electric to file a revised Plan within 30 days of service of this letter that either fully complies with 52 Pa. Code § 57.198(n)(4) and (n)(6), or that proposes an exemption for the minimum visual inspection timeframes that will provide for a visual inspection of all distribution overhead lines, overhead distribution transformers and above-ground pad-mounted transformers on some reasonable periodic basis.

If you are dissatisfied with the resolution of this matter, you may, as set forth in 52 Pa. Code § 5.44, file a petition for reconsideration from actions of the staff with the Commission within twenty (20) days after the date of this letter. Please direct any questions regarding this filing to John Van Zant, Reliability and Emergency Preparedness Supervisor, Bureau of Technical Utility Services at (717) 773-7380, or jvanvant@pa.gov.

Sincerely,



Rosemary Chiavetta
Secretary

⁹ See, 52 Pa. Code § 57.198(n)(4) and (n)(6).

cc: Preston Walker, PPL Electric, pwalker@pplweb.com
Kris Brown, LAW
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