BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of the Dayton Power and Light Company to Amend its Transmission and Distribution Inspection, Maintenance, Repair and Replacement Programs Pursuant to Section 4901:1-10-27, Ohio Administrative Code, Regarding Electric Companies.	)))))))	Case No. 19-1737-EL-ESS

APPLICATION OF THE DAYTON POWER AND LIGHT COMPANY TO AMEND ITS TRANSMISSION AND DISTRIBUTION INSPECTION, MAINTENANCE, REPAIR AND REPLACEMENT PROGRAMS

Pursuant to Section 4901:1-10-27(F)(1), the Dayton Power and Light Company ("DP&L" or "the Company") submits this application to amend its Transmission and Distribution Inspection, Maintenance, Repair and Replacement Programs ("Programs"). In support of the application, the Company has attached Exhibit A, redline to current Programs; and Exhibit B, clean version of proposed modifications to the Programs.

DP&L is a public utility and electric light company as defined by R.C. §4905.02 and §4905.03(C) respectively, and an electric distribution utility as defined by R.C. §4928.01(A)(6). Pursuant to Section 4901:1-10-27(E)(1), each electric utility and transmission owner shall establish, maintain, and comply with written programs, policies, procedures, and schedules for the inspection, maintenance, repair, and replacement of its transmission and distribution circuits and equipment ("Programs"). Section 4901:1-10-27(E)(2) provides that utilities and transmission owners shall file with the Commission the utilities' inspection, maintenance, repair, and replacement programs. Utilities and transmission owners must also file with the Commission

revisions and amendments to the Programs. Accordingly, descriptions of the Company's proposed amendments are set forth below.

I. Substation Transformers

Beginning in 2020, DP&L shall implement a new condition-based program for substation autotransformers, substation autotransformer load tap changers (LTC) and breakers. This change shifts DP&L from its traditional time-based maintenance program to a more robust maintenance program, which includes an annual dissolved gas analysis of the oil and dielectric test of each substation class autotransformer's main tank and associated LTC (where applicable). Using the diagnostic results of the oil sample, DP&L will be able to address developing equipment problems.

Also beginning in 2020, DP&L shall eliminate dielectric testing on substation regulators. Historically, dielectric testing on substation regulators was performed on large, three-phase regulators which typically require periodic maintenance and inspection. Taking routine oil samples on three-phase regulators was a desirable feature and the volume of oil was sufficient to allow for this type of testing. However, most three-phase regulators have been replaced with single-phase line regulators which require virtually no maintenance and are run to "end-of-life". Single-phase regulators are not designed to allow for continued, periodic and routine oil tests or for this type of testing. After just a few oil tests, oil would need to be added back to the regulator as the volume of oil is significantly small compared to the older three-phase regulators. Furthermore, the Company's statistics show an incredibly small failure rate on single-phase regulators that were not due to auto accidents and animal contacts.

Additionally, beginning in 2020, DP&L shall eliminate time travel testing on SF6 and vacuum circuit breakers because technology has improved, and current maintenance requirements are minimal. The Company's statistical data shows very few problems with its typical SF6 and

vacuum circuit breakers are related to timing, and there is very little provision to adjust a breaker without factory help on-site. Therefore, any benefits of time travel testing for these breakers is minimal.

II. Conclusion

DP&L respectfully submits the above amendments to be incorporated within the Company's Transmission and Distribution Inspection, Maintenance, Repair and Replacement Programs beginning in 2020.

Respectfully Submitted,

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Exhibit A - Redline

The Dayton Power and Light Company
Inspection, Maintenance, Repair and Replacement of Transmission
And Distribution Facilities (Circuits and Equipment) Program

Introduction

The Dayton Power & Light Company has adopted a results-based approach to the development and evaluation of maintenance and inspection programs. All maintenance, inspection and capital planning practices contribute to overall system performance. Reliability performance is regularly reviewed and integrated into our programs. DP&L's system level reliability performance is measured by the following industry standard indicators

- SAIFI (System Average Interruption Frequency Index)
- CAIDI (Customer Average Interruption Duration Index)
- SAIDI (System Average Interruption Duration Index)

This report provides a detailed overview of Dayton Power and Light's maintenance and inspection programs. In addition to the programs listed herein, the following operational practices work to ensure safe and reliable operation of the electric transmission and distribution system:

- Dayton Power and Light maintains a 24-hour emergency response operation and all unplanned outages are promptly addressed.

- Adequate inventory is maintained such that the supply of parts does not impact restoration time.

- All employees performing maintenance and inspection work are properly trained to do their jobs safely. OSHA (Occupational Health and Safety Administration) guidelines are followed for inspection and maintenance programs, just as they are for all other types of work.

- All facilities are designed and operated to meet NESC (National Electric Safety Code) requirements. Any safety violation noted during an inspection is promptly repaired.

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a. Poles and Towers

1. Program objectives

The goal of this program is to inspect, maintain, repair and replace poles to ensure safe and reliable operation of the distribution system.

2. Overview of procedures

Poles with an actual or estimated vintage greater than 25 years, or those poles that have visible defects will be tested to determine suitability, structural soundness and need for maintenance, repair, or replacement (if applicable). Identified poles shall be sound tested, bored and ground line excavated by a third party contractor. Poles which fail visual and physical screening as referenced in the '*Distribution Maintenance and Inspection Programs Manual*, will either be replaced or reinforced.

3. Identification of poles inspected and tested

Ten percent (10%) of DP&L's circuits will be identified on an annual basis for pole inspections and test[1]. All poles from the substation to the customer drop will be examined. Poles with an actual or estimated vintage greater than 25 years or older will be visually and physically inspected and tested. Poles that fail either the visual inspection or the physical inspection and test will be replaced or reinforced. At any point in the inspection process, a pole is designated as "fail", no additional visual or physical inspection or testing will be performed; the pole will be scheduled for replacement or reinforcement.

4. Justification for program schedule

Industry standards generally indicate a 10 year inspection cycle is warranted. Where possible, this evaluation program is to coincide with DP&L's Overhead Distribution Patrol Program (DLP), referenced in the '*Distribution Maintenance and Inspection Programs Manual.*

5. Process of documenting and recording program activities

Circuits identified for inspection will be electronically documented annually. Inspection data on all inspected poles will be gathered in accordance with the procedures outlined in the, *'Distribution Maintenance and Inspection Programs Manual*. Inspection data for all poles which receive physical inspection and testing will be tracked using GPS coordinates and/or pole numbers. All pole inspection and test information will be recorded into electronic database files or other appropriate records. Pole inspection information shall be kept in an electronic format that has the capability of generating statistical information. The inspection process also includes the identification and documentation of any two-pole conditions that may be present.

[1] DP&L will complete the first cycle of the pole inspection within 8 years (i.e. first cycle 2006 through 2013, second cycle 2016 – 2025). All subsequent cycles will be based upon a 10 year cycle.

Pole failure statistics will be tracked (effective 1/1/2006) and monitored by circuit to evaluate program performance and effectiveness.

6. **Process for reviewing program results and making repair/replacements based upon those findings.**
   The decision to repair or replace a pole will be based upon field testing results by qualified field personnel in accordance with inspection procedures outlined in the, *'Distribution Maintenance and Inspection Programs Manual'.* Poles and Towers with recorded defects that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of the many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed.**
   Reliability Operations will review the progress of the inspections on a periodic basis to ensure program compliance. On an annual basis, the effectiveness of the program will be evaluated.

b. Circuit and Line Inspections

1. Program objectives

The goal of this program is to maintain reliable operation of the electric distribution system.

2. Overview of procedures

This primarily corrective program is designed to target reliability problem areas. Distribution circuit and branch line reliability performance is monitored, problem areas are identified and corrective action is taken as needed. The detailed procedures, which inspect all segments of the distribution circuit (primary and secondary) from the substation to the customer service drop are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*. The Program components are as follows:

a. ***Task Name*:** Monitor circuit reliability performance
***Frequency*:** Annually
***Description*:** Identify circuits that are performing poorly in terms of reliability. Evaluate the outage history and physical condition of all circuits and initiate remedial action, if necessary, on the worst 8% of the circuits (as defined by the previously submitted DPL index).

b. ***Task Name*:** Monitor branch line reliability performance
***Frequency*:** Monthly
***Description*:** Identify branch lines that are performing poorly in terms of reliability. Evaluate the outage history and physical condition of the branch lines and initiate remedial action if necessary.

c. ***Task Name*:** Electric Distribution Patrol (Overhead Distribution Patrol Program)
***Frequency*:** Every five years (20% of the overhead circuits will be inspected on an annual basis)
***Description*:** The Overhead Distribution Patrol Program is designed to examine the general condition of the hardware, conductor, poles, clearances, and tree conditions on the specified overhead distribution circuits. This comprehensive inspection includes the mainline overhead distribution facilities from the substation including all branch lines. The inspection process also includes the identification and documentation of any two-pole conditions that may be present.

3. Identification of equipment examined

Distribution poles, conductor and hardware.

4. Justification for program schedule

The methodology for this program is based on engineering judgment and industry standards.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described above. At a minimum, inspections and deficiencies are documented and maintained.

6. **Process for reviewing program results and making repairs/replacements based on those findings**

   The decision to repair or replace is based on field experience and engineering judgment.

   For the Overhead Distribution Patrol Program, the program will be reviewed periodically by Reliability Operations to ensure that the inspections are being conducted correctly and that sufficient progress is being made in conducting the inspections. Any recorded deficiencies noted during the Distribution Line Patrol Program that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**

   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution circuits and branch lines, if field inspectors identify a high percentage of pole replacements and repairs in a particular area, a capital project may be initiated to rebuild that section of the circuit.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed. In the case of distribution circuits and branch lines, reliability performance is reviewed on a monthly basis and problem areas are targeted as needed.

c. Primary enclosures (e.g., pad-mounted transformers and pad-mounted switch gear) and secondary enclosures (e.g., pedestals and hand holes)

1. Program objectives

The U.R.D. (Underground Residential Distribution) inspection program is a comprehensive program to verify the physical and visual condition of U.R.D. devices and to correct any safety issues. The detailed procedures, which inspect all segments of the distribution circuit (primary and secondary) from the substation to the customer's service are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

2. Overview of procedures

a. ***Task Name*:** Inspect U.R.D. equipment
***Frequency*:** The inspections will be performed by "map grid", not by circuit. 20% of all grids will be inspected yearly, with the entire system being inspected once every five years.
***Description*:** Inspect and make repairs as needed

3. Identification of equipment examined

The underground device inspection program includes Pad-Mounted Transformers, Pedestals, LBC's (Load Break Centers), PMH's (Pad Mounted Housing Switches) and risers.

4. Justification for program schedule

The program guidelines are based on NESC requirements, industry practice and company experience

5. Process of documenting and recording program activities

Underground devices are highlighted on inspection prints and any repair items are documented on the "Departmental Order" form at the time of inspection. Devices requiring follow-up work are documented and tracked in the Maintenance Work Order (MWO) database until completion.

6. Process for reviewing program results and making repairs/replacements based on those findings

The decision to repair or replace is based on the judgment of qualified field personnel. Field inspectors carry a repair kit and all minor repairs are completed at the time of the inspection. If more extensive work is required, the problem is documented and scheduled for repair. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

d. Line Reclosers

1. Program objectives

The goal of this program is to maintain reliable operation of key components of the distribution system.

2. Overview of procedures

Distribution system device maintenance programs are primarily preventive in nature. The detailed procedures are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

a. ***Task Name*:** Line Recloser Inspections
***Frequency*:** Annually
***Description*:** Visually check physical condition, record counter reading, ambient temperature and load.

3. Identification of equipment examined

This program includes line reclosers.

4. Justification for program schedule

Maintenance and inspection schedules for overhead distribution devices are based on a combination of manufacturer recommendations and company experience.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described below. At a minimum, inspections and deficiencies are documented and maintained.

6. Process for reviewing program results and making repairs/replacements based on those findings

The determination to repair versus replace varies for each component and is generally based on the judgment of qualified field personnel and engineering. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution system components, capital projects may be initiated based on the finding of field inspections.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

e. Line Capacitors

1. Program objectives

The goal of this program is to maintain reliable operation of key components of the distribution system.

2. Overview of procedures

Distribution system device maintenance programs are primarily preventive in nature. The detailed procedures are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

a. ***Task Name*:** Capacitor Inspections
***Frequency*:** Annually
***Description*:** Check cutouts, switches and controls. Repair or adjust as needed.

3. Identification of equipment examined

This program includes capacitors.

4. Justification for program schedule

Maintenance and inspection schedules for overhead distribution devices are based on a combination of manufacturer recommendations and company experience.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described below. At a minimum, inspections and deficiencies are documented and maintained.

6. Process for reviewing program results and making repairs/replacements based on those findings

The determination to repair versus replace varies for each component and is generally based on the judgment of qualified field personnel and engineering. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution system components, capital projects may be initiated based on the finding of field inspections.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

f. Distribution Right of Way (Vegetation Management)

1. Program objectives

The goal of this program is to maintain the reliability of the electric distribution system by preventing outages and equipment damage due to trees or other vegetation contacting the lines. The detailed procedures are outlined in the *'Dayton Power & Light Company Line Clearance Program Alliance'*.

2. Overview of procedures

a. ***Task Name*:** Distribution line clearance
***Frequency*:** 5 Years (see Cycle "Levelization" Plan below)
***Description*:** Trim or remove trees and brush as needed. Clearances will vary depending upon tree species.

3. Identification of equipment examined

Complete a 5 year trim cycle from substation to the customer service drop with no circuit having a last trim date of greater than 5 calendar years. Line clearance is performed on overhead primary and secondary distribution conductors using ANSI standards (including, but not limited to "A300" and "Z133.1-1994") as a basis for clearance.

4. Justification for program schedule

The 5 year cycle interval has been determined to be an optimal timeframe between circuit trims to limit tree outages caused by Trees in ROW and also to meet state regulatory needs.

5. Process of documenting and recording program activities

Line clearance activity is tracked in a database including last trim date, total circuit miles and circuit miles trimmed. Subcontractors update primary prints to document their progress. Records will be maintained for a minimum of 5 years.

6. Process for reviewing program results

Line clearance field inspectors audit subcontractor performance to ensure clearances are adequate. Deficient work is returned to the subcontractor for remediation. However, The Dayton Power & Light Company does note that exceptions to strict clearances may occur as a result of property owner refusal, political & societal factors, community ordinances and easement rights.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

   Audits are conducted to ensure contractor work meets specifications. Tree related outages are also reviewed on a monthly basis.

Cycle "Levelization" Plan (Start date 1-1-2015; End Date 12-31-2019)

Effective with the 2015 program year, DP&L will embark upon a "Cycle Levelization" process to transition to a work schedule that more closely maintains 20% of the vegetation conditions on an annual basis. The schedule will strive to achieve a more stable workload over the duration of the cycle. Circuits will be delayed a maximum of 1 year and in some cases accelerated 1 year from the original cycle schedule. This process will be completed at the end of 2019.

As part of this process, DP&L will employ an "Inspect/Maintain" process in the original cycle year for the particular circuit to ensure that the delay in the full circuit maintenance does not create undue safety and/or reliability issues. This "Inspect/Maintain" process will include a full circuit patrol by a person knowledgeable in the specifications of DP&L's vegetation management program. The patrol of the circuit will identify any vegetation conditions that may result in service interruptions prior to the full circuit maintenance to be performed the following year. These conditions will be mitigated as quickly as possible.

g. Substations

Substation Transformers

1. Program objectives

The goal of this program is ensure reliable operation and to extend the operating life of substation class transformers.

2. Overview of procedures

This program is ~~primarily~~ condition-~~ed~~ based and preventive in nature. In addition to the tasks listed below, condition-~~ed~~ based and predictive maintenance is applied to ~~selected~~ transformers ~~units~~ in the form of continuous monitoring of nitrogen pressure, LTC/main tank temperature differential, and main tank oil temperature (as applicable). Additional tasks such as internal visual inspections, megger test, etc. are performed as needed based on engineering judgment. Substation transformer loading is also continuously monitored to ensure that thermal limits are not exceeded. Routine scheduled tasks include the following:

a. ***Task Name*:** External Visual Inspection
***Frequency*:** Twelve times annually, with no inspection interval exceeding forty calendar days between inspections.
***Description*:** Check for oil leaks, ground faults, failed cooling fans, high temperature, high or low pressure, clogged or damaged grills, damaged gauges.

b. ***Task Name*:** Thermographic Imaging
***Frequency*:** Yearly
***Description*:** Check for hot spots due to loose connections.

c. ***Task Name*:** Dielectric Oil Breakdown Test of Transformer Main Tank ~~on Three-Phase Regulators~~
***Frequency*:** ~~Every five years~~Annually. On a case by case basis, additional testing may be completed for diagnostic analysis (i.e. trending).
***Description*:** Test the dielectric strength of the oil. Complete maintenance activities as needed. Maintenance activities will be performed as a result of the oil's dielectric and moisture properties. ~~Replace or filter oil if needed.~~

d. ***Task Name*:** Dielectric Oil Breakdown Test of Transformer LTC ~~Maintenance~~
***Frequency*:** ~~Every five years~~Annually. On a case by case basis, additional testing may be completed for diagnostic analysis (i.e. trending).

***Description*:** ~~Perform routine maintenance on LTC's~~Complete maintenance activities as needed. Maintenance activities will be performed as a result of the oil's dielectric and moisture properties.

e. ***Task Name*:** Perform ~~Doble~~ Power Factor Test
***Frequency*:** Every seven years
***Description*:** Perform this test to check for insulation degradation.

3. **Identification of equipment examined**
   All substation transformers are included in this program.

4. **Justification for program schedule**
   Maintenance and inspection practices are based on engineering experience and industry practices. The criticality of equipment is determined based on the voltage class, system configuration and loading.

5. **Process of documenting and recording program activities**
   All data is tracked in a Computerized Maintenance Management System (CMMS) program. The CMMS system holds a Maintenance Task Table that shows historical and scheduled maintenance for each device. The system also generates and tracks maintenance and repair work orders.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   Repair versus replacement determination is made based on engineering judgment and life cycle cost. The CMMS program is an excellent tool for tracking reliability by equipment manufacturer and model. If CMMS data shows a pattern of problems or failures, the entire class of like equipment may be scheduled for replacement or repair.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of substation equipment, specific classes of equipment may be scheduled for replacement based on failure history or total owning cost.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Circuit Breakers

1. **Program objectives**
   The goal of this program is ensure reliable operation and extend the operating life of circuit breakers.

2. **Overview of procedures**

   a. ***Task Name*:** Operational Test
      ***Frequency*:** As needed to ensure breakers are operated at least once per year
      ***Description*:** Test to ensure proper operation. Repair or adjust as needed.

b. ***Task Name*:** Visual Inspection
***Frequency*:** Twelve times annually, with no inspection interval exceeding forty calendar days between inspections.

***Description*:** Check for oil leaks, cracked or damaged bushings and other items depending on the type of unit. Repair or adjust as needed.

c. ***Task Name*:** Preventive Maintenance
***Frequency*:** Varies depending on type (i.e. oil, vacuum, SF6, etc.) and vintage[2]
***Description*:** Varies depending on type (i.e. oil, vacuum, SF6, etc.) and vintage

3. **Identification of equipment examined**
This program includes all substation circuit breakers.

4. **Justification for program schedule**
The breaker maintenance program is preventive in nature and methodology is based on company experience. The criticality of equipment is determined based on the voltage class, system configuration and loading.

5. **Process of documenting and recording program activities**
All data is tracked in a Computerized Maintenance Management System (CMMS) program. The CMMS system holds a Maintenance Task Table that shows historical and scheduled maintenance for each device. The system also generates and tracks maintenance and repair work orders.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
Repair versus replacement determination is made based on engineering judgment and life cycle cost. The CMMS program is an excellent tool for tracking reliability by equipment manufacturer and model. If CMMS data shows a pattern of problems or failures, the entire class of like equipment may be scheduled for replacement or repair.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of substation equipment, specific classes of equipment may be scheduled for replacement based on failure history or total owning cost.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

[2] Effective 2020, DP&L will eliminate time travel testing on SF6 and vacuum circuit breakers.

Relays

1. **Program objectives**
   The goal of this program is ensure reliable operation of relays.

2. **Overview of procedures**
   This program is preventive in nature. The testing schedule is as follows:

   a. ***Task Name*:** Calibration and Trip Test
   ***Frequency*:** 345 kV and 138 kV – every six years for non-digital relays and every twelve years for digital relays,
   69 kV and 33 kV – every eight years for non-digital relays and every twelve years for digital relays,
   12 kV and 4 kV – every ten years for non-digital relays and every twelve years for digital relays,
   Under Frequency and Load Shed Relays – every 5 years for non-digital relays and every 10 years for digital relays.

   ***Description*:** Calibrate and test to ensure proper operation.

3. **Identification of equipment examined**
   All relays are included in the program.

4. **Justification for program schedule**
   Procedures are based on company experience and manufacturer documentation. Criticality is determined based on voltage class.

5. **Process of documenting and recording program activities**
   Calibration/trip test results are documented on Relay Field Test Cards. The most recent test results are kept on file for every relay on the system. The Computerized Maintenance Management System (CMMS) shows the overall program schedule and status.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   After reviewing test results, the decision to repair or replace is made based on engineering judgment and manufacturer specifications.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Substation Switches

1. **Program objectives**
   The goal of this program is to maintain the reliable operation of switches in substations.

2. **Overview of procedures**
   This program is preventive in nature.

3. **Identification of equipment examined**
   All substation switches are included in the program.

4. **Justification for program schedule**
   Equipment criticality is determined based on voltage class and system configuration.

   a. ***Task Name*:** Thermographic Inspection
      ***Frequency*:** Annually
      ***Description*:** Check for hot spots and repair or adjust as needed.

5. **Process of documenting and recording program activities**
   All data is tracked in a Computerized Maintenance Management System (CMMS) program. The CMMS system holds a Maintenance Task Table that shows historical and scheduled maintenance for each device. The system also generates and tracks maintenance and repair work orders.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   Repair versus replacement determination is based on company experience. If field personnel experience problems operating a particular switch, the switch will be maintained and lubricated. The CMMS program is an excellent tool for tracking reliability by equipment manufacturer and model. If CMMS data shows a pattern of problems or failures, the entire class of like equipment may be scheduled for replacement or repair.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of substation equipment, specific classes of equipment may be scheduled for replacement based on failure history or total owning cost.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

h. Voltage Regulators

1. Program objectives

The goal of this program is to maintain reliable operation of key components of the distribution system.

2. Overview of procedures

Distribution system device maintenance programs are primarily preventive in nature. The detailed procedures are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

a. ***Task Name*:** Voltage Regulator Inspections
***Frequency*:** Biennially
***Description*:** Inspection that includes a control check, and visual check of the physical condition and indicator readings (min, max and current).

3. Identification of equipment examined

This program includes voltage regulators.

4. Justification for program schedule

Maintenance and inspection schedules for overhead distribution devices are based on a combination of manufacturer recommendations and company experience.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described below. At a minimum, inspections and deficiencies are documented and maintained.

6. Process for reviewing program results and making repairs/replacements based on those findings

The determination to repair versus replace varies for each component and is generally based on the judgment of qualified field personnel and engineering. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution system components, capital projects may be initiated based on the finding of field inspections.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

i. Transmission

Transmission Lines

1. Program objectives

The goal of this program is to maintain the reliability and safety of the electric transmission system including facilities ranging from 33kV to 345 kV.

2. Overview of procedures

This preventive program consists primarily of visual and infrared inspections of structures/poles, insulators, switches and conductors. Guidelines for each voltage class/type are as follows:

345 kV

a. ***Task Name*:** Helicopter Patrol
***Frequency*:** Quarterly
***Description*:** Look for mechanical problems, erosion and vegetation problems. Initiate corrective action as needed.

b. ***Task Name:*** Thermography
Frequency: As needed
Description: Check line switches for heating indicative of poor electrical connections. Identify "hot spots" and classify according to elevation above ambient temperature. Complete necessary repairs.

138 kV

a. ***Task Name*:** Helicopter Patrol or ground patrols for areas in Metro Dayton "No Fly" Zones.
Frequency: Quarterly
***Description*:** Look for mechanical problems, erosion and vegetation problems. Initiate corrective action as needed.

b. ***Task Name:*** Thermography
Frequency: As needed
Description: Check line switches for heating indicative of poor electrical connections. Identify "hot spots" and classify according to elevation above ambient temperature. Complete necessary repairs.

69 kV and 33 kV

a. ***Task Name*:** Helicopter Patrol or ground patrols for areas in Metro Dayton "No Fly" Zones.
***Frequency*:** Semiannually
***Description*:** Look for mechanical problems, erosion and vegetation problems. Initiate corrective action as needed.

b. ***Task Name:*** Thermography
Frequency: As needed
Description: Check line switches for heating indicative of poor electrical connections. Identify "hot spots" and classify according to elevation above ambient temperature. Complete necessary repairs.

Underground

a. ***Task Name*:** Cathodic Protection System Test (if applicable)
***Frequency*:** Yearly
***Description*:** Test the integrity of the corrosion protection on the steel pipe housing for the underground transmission cable. Initiate corrective action as needed.

3. Identification of equipment examined
This program includes transmission structures/poles, insulators, switches and conductors from 33kV through 345 kV.

4. Justification for program schedule
The National Electric Safety Code is used as a guideline to establish minimum requirements. Criticality of equipment is determined by voltage class (i.e. 345 kV lines are the most critical).

5. Process of documenting and recording program activities
All deficiencies are documented and maintained in a database.

6. Process for reviewing program results and making repairs/replacements based on those findings
The determination to repair or replace is based on the inspection findings combined with engineering judgment.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process
Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Transmission Right of Way (Vegetation Management)

1. **Program objectives**
   The goal of this program is to maintain the reliability of the electric transmission system by preventing outages and equipment damage due to trees or other vegetation contacting the lines.

2. **Overview of procedures**

   a. ***Task Name*:** Line Clearance
   ***Frequency*:** Varies depending on line location, clearance requirements and species of vegetation present
   ***Description*:** Trim or remove trees and brush as needed. Clearance will vary based on the species of tree and the voltage class of the line.

   b. ***Task Name*:** Herbicide Application
   Frequency: As needed.
   Description: Herbicide is applied as needed.

   c. ***Task Name*:** Visual Inspection
   Frequency: "Walking patrols" are used to inspect the Metro Dayton "No Fly" Zones. These inspection patrols are scheduled three to four times per year.

   "Helicopter Patrols" are targeted as follows:

All 345kV circuits	Quarterly
All 138kV circuits	Quarterly
All 69kV circuits	Semi annually
All 33kV circuits	Semi annually

   ***Description*:** Visually inspect and identify any problems spots. Off-cycle trimming "hot-spotting" will be performed as needed to correct problem areas.

3. **Identification of equipment examined**
   All overhead transmission lines are included in the vegetation management program.

4. **Justification for program schedule**
   The vegetation management program is preventive in nature and the guidelines are based on company experience. Criticality of lines is determined based on voltage class and system configuration. DP&L also maintains and keeps current it's' Transmission Vegetation Management Program as required in NERC Standard FAC-003-1.

5. **Process of documenting and recording program activities**
   Program activities are recorded in a database.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   Information from field inspections is entered into the transmission line clearance database. This database is used to track the progress of all work from originating inspection to final inspection. This database is targeted for weekly updates. All completed work is inspected for quality control.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Exhibit B - Clean

The Dayton Power and Light Company
Inspection, Maintenance, Repair and Replacement of Transmission
And Distribution Facilities (Circuits and Equipment) Program

Introduction

The Dayton Power & Light Company has adopted a results-based approach to the development and evaluation of maintenance and inspection programs. All maintenance, inspection and capital planning practices contribute to overall system performance. Reliability performance is regularly reviewed and integrated into our programs. DP&L's system level reliability performance is measured by the following industry standard indicators

- SAIFI (System Average Interruption Frequency Index)
- CAIDI (Customer Average Interruption Duration Index)
- SAIDI (System Average Interruption Duration Index)

This report provides a detailed overview of Dayton Power and Light's maintenance and inspection programs. In addition to the programs listed herein, the following operational practices work to ensure safe and reliable operation of the electric transmission and distribution system:

- Dayton Power and Light maintains a 24-hour emergency response operation and all unplanned outages are promptly addressed.

- Adequate inventory is maintained such that the supply of parts does not impact restoration time.

- All employees performing maintenance and inspection work are properly trained to do their jobs safely. OSHA (Occupational Health and Safety Administration) guidelines are followed for inspection and maintenance programs, just as they are for all other types of work.

- All facilities are designed and operated to meet NESC (National Electric Safety Code) requirements. Any safety violation noted during an inspection is promptly repaired.

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a. Poles and Towers

1. Program objectives

The goal of this program is to inspect, maintain, repair and replace poles to ensure safe and reliable operation of the distribution system.

2. Overview of procedures

Poles with an actual or estimated vintage greater than 25 years, or those poles that have visible defects will be tested to determine suitability, structural soundness and need for maintenance, repair, or replacement (if applicable). Identified poles shall be sound tested, bored and ground line excavated by a third party contractor. Poles which fail visual and physical screening as referenced in the '*Distribution Maintenance and Inspection Programs Manual*, will either be replaced or reinforced.

3. Identification of poles inspected and tested

Ten percent (10%) of DP&L's circuits will be identified on an annual basis for pole inspections and test[1]. All poles from the substation to the customer drop will be examined. Poles with an actual or estimated vintage greater than 25 years or older will be visually and physically inspected and tested. Poles that fail either the visual inspection or the physical inspection and test will be replaced or reinforced. At any point in the inspection process, a pole is designated as "fail", no additional visual or physical inspection or testing will be performed; the pole will be scheduled for replacement or reinforcement.

4. Justification for program schedule

Industry standards generally indicate a 10 year inspection cycle is warranted. Where possible, this evaluation program is to coincide with DP&L's Overhead Distribution Patrol Program (DLP), referenced in the '*Distribution Maintenance and Inspection Programs Manual.*

5. Process of documenting and recording program activities

Circuits identified for inspection will be electronically documented annually. Inspection data on all inspected poles will be gathered in accordance with the procedures outlined in the, *'Distribution Maintenance and Inspection Programs Manual*. Inspection data for all poles which receive physical inspection and testing will be tracked using GPS coordinates and/or pole numbers. All pole inspection and test information will be recorded into electronic database files or other appropriate records. Pole inspection information shall be kept in an electronic format that has the capability of generating statistical information. The inspection process also includes the identification and documentation of any two-pole conditions that may be present.

[1] DP&L will complete the first cycle of the pole inspection within 8 years (i.e. first cycle 2006 through 2013, second cycle 2016 – 2025). All subsequent cycles will be based upon a 10 year cycle.

Pole failure statistics will be tracked (effective 1/1/2006) and monitored by circuit to evaluate program performance and effectiveness.

6. **Process for reviewing program results and making repair/replacements based upon those findings.**
   The decision to repair or replace a pole will be based upon field testing results by qualified field personnel in accordance with inspection procedures outlined in the, *'Distribution Maintenance and Inspection Programs Manual'.* Poles and Towers with recorded defects that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of the many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed.**
   Reliability Operations will review the progress of the inspections on a periodic basis to ensure program compliance. On an annual basis, the effectiveness of the program will be evaluated.

b. Circuit and Line Inspections

1. Program objectives

The goal of this program is to maintain reliable operation of the electric distribution system.

2. Overview of procedures

This primarily corrective program is designed to target reliability problem areas. Distribution circuit and branch line reliability performance is monitored, problem areas are identified and corrective action is taken as needed. The detailed procedures, which inspect all segments of the distribution circuit (primary and secondary) from the substation to the customer service drop are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*. The Program components are as follows:

a. ***Task Name*:** Monitor circuit reliability performance
***Frequency*:** Annually
***Description*:** Identify circuits that are performing poorly in terms of reliability. Evaluate the outage history and physical condition of all circuits and initiate remedial action, if necessary, on the worst 8% of the circuits (as defined by the previously submitted DPL index).

b. ***Task Name*:** Monitor branch line reliability performance
***Frequency*:** Monthly
***Description*:** Identify branch lines that are performing poorly in terms of reliability. Evaluate the outage history and physical condition of the branch lines and initiate remedial action if necessary.

c. ***Task Name*:** Electric Distribution Patrol (Overhead Distribution Patrol Program)
***Frequency*:** Every five years (20% of the overhead circuits will be inspected on an annual basis)
***Description*:** The Overhead Distribution Patrol Program is designed to examine the general condition of the hardware, conductor, poles, clearances, and tree conditions on the specified overhead distribution circuits. This comprehensive inspection includes the mainline overhead distribution facilities from the substation including all branch lines. The inspection process also includes the identification and documentation of any two-pole conditions that may be present.

3. Identification of equipment examined

Distribution poles, conductor and hardware.

4. Justification for program schedule

The methodology for this program is based on engineering judgment and industry standards.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described above. At a minimum, inspections and deficiencies are documented and maintained.

6. **Process for reviewing program results and making repairs/replacements based on those findings**

   The decision to repair or replace is based on field experience and engineering judgment.

   For the Overhead Distribution Patrol Program, the program will be reviewed periodically by Reliability Operations to ensure that the inspections are being conducted correctly and that sufficient progress is being made in conducting the inspections. Any recorded deficiencies noted during the Distribution Line Patrol Program that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**

   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution circuits and branch lines, if field inspectors identify a high percentage of pole replacements and repairs in a particular area, a capital project may be initiated to rebuild that section of the circuit.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed. In the case of distribution circuits and branch lines, reliability performance is reviewed on a monthly basis and problem areas are targeted as needed.

c. Primary enclosures (e.g., pad-mounted transformers and pad-mounted switch gear) and secondary enclosures (e.g., pedestals and hand holes)

1. Program objectives

The U.R.D. (Underground Residential Distribution) inspection program is a comprehensive program to verify the physical and visual condition of U.R.D. devices and to correct any safety issues. The detailed procedures, which inspect all segments of the distribution circuit (primary and secondary) from the substation to the customer's service are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

2. Overview of procedures

a. ***Task Name*:** Inspect U.R.D. equipment
***Frequency*:** The inspections will be performed by "map grid", not by circuit. 20% of all grids will be inspected yearly, with the entire system being inspected once every five years.
***Description*:** Inspect and make repairs as needed

3. Identification of equipment examined

The underground device inspection program includes Pad-Mounted Transformers, Pedestals, LBC's (Load Break Centers), PMH's (Pad Mounted Housing Switches) and risers.

4. Justification for program schedule

The program guidelines are based on NESC requirements, industry practice and company experience

5. Process of documenting and recording program activities

Underground devices are highlighted on inspection prints and any repair items are documented on the "Departmental Order" form at the time of inspection. Devices requiring follow-up work are documented and tracked in the Maintenance Work Order (MWO) database until completion.

6. Process for reviewing program results and making repairs/replacements based on those findings

The decision to repair or replace is based on the judgment of qualified field personnel. Field inspectors carry a repair kit and all minor repairs are completed at the time of the inspection. If more extensive work is required, the problem is documented and scheduled for repair. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

d. Line Reclosers

1. Program objectives

The goal of this program is to maintain reliable operation of key components of the distribution system.

2. Overview of procedures

Distribution system device maintenance programs are primarily preventive in nature. The detailed procedures are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

a. ***Task Name*:** Line Recloser Inspections
***Frequency*:** Annually
***Description*:** Visually check physical condition, record counter reading, ambient temperature and load.

3. Identification of equipment examined

This program includes line reclosers.

4. Justification for program schedule

Maintenance and inspection schedules for overhead distribution devices are based on a combination of manufacturer recommendations and company experience.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described below. At a minimum, inspections and deficiencies are documented and maintained.

6. Process for reviewing program results and making repairs/replacements based on those findings

The determination to repair versus replace varies for each component and is generally based on the judgment of qualified field personnel and engineering. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution system components, capital projects may be initiated based on the finding of field inspections.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

e. Line Capacitors

1. Program objectives

The goal of this program is to maintain reliable operation of key components of the distribution system.

2. Overview of procedures

Distribution system device maintenance programs are primarily preventive in nature. The detailed procedures are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

a. ***Task Name*:** Capacitor Inspections
***Frequency*:** Annually
***Description*:** Check cutouts, switches and controls. Repair or adjust as needed.

3. Identification of equipment examined

This program includes capacitors.

4. Justification for program schedule

Maintenance and inspection schedules for overhead distribution devices are based on a combination of manufacturer recommendations and company experience.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described below. At a minimum, inspections and deficiencies are documented and maintained.

6. Process for reviewing program results and making repairs/replacements based on those findings

The determination to repair versus replace varies for each component and is generally based on the judgment of qualified field personnel and engineering. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution system components, capital projects may be initiated based on the finding of field inspections.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

f. Distribution Right of Way (Vegetation Management)

1. Program objectives

The goal of this program is to maintain the reliability of the electric distribution system by preventing outages and equipment damage due to trees or other vegetation contacting the lines. The detailed procedures are outlined in the *'Dayton Power & Light Company Line Clearance Program Alliance'*.

2. Overview of procedures

a. ***Task Name*:** Distribution line clearance
***Frequency*:** 5 Years (see Cycle "Levelization" Plan below)
***Description*:** Trim or remove trees and brush as needed. Clearances will vary depending upon tree species.

3. Identification of equipment examined

Complete a 5 year trim cycle from substation to the customer service drop with no circuit having a last trim date of greater than 5 calendar years. Line clearance is performed on overhead primary and secondary distribution conductors using ANSI standards (including, but not limited to "A300" and "Z133.1-1994") as a basis for clearance.

4. Justification for program schedule

The 5 year cycle interval has been determined to be an optimal timeframe between circuit trims to limit tree outages caused by Trees in ROW and also to meet state regulatory needs.

5. Process of documenting and recording program activities

Line clearance activity is tracked in a database including last trim date, total circuit miles and circuit miles trimmed. Subcontractors update primary prints to document their progress. Records will be maintained for a minimum of 5 years.

6. Process for reviewing program results

Line clearance field inspectors audit subcontractor performance to ensure clearances are adequate. Deficient work is returned to the subcontractor for remediation. However, The Dayton Power & Light Company does note that exceptions to strict clearances may occur as a result of property owner refusal, political & societal factors, community ordinances and easement rights.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

   Audits are conducted to ensure contractor work meets specifications. Tree related outages are also reviewed on a monthly basis.

Cycle "Levelization" Plan (Start date 1-1-2015; End Date 12-31-2019)

Effective with the 2015 program year, DP&L will embark upon a "Cycle Levelization" process to transition to a work schedule that more closely maintains 20% of the vegetation conditions on an annual basis. The schedule will strive to achieve a more stable workload over the duration of the cycle. Circuits will be delayed a maximum of 1 year and in some cases accelerated 1 year from the original cycle schedule. This process will be completed at the end of 2019.

As part of this process, DP&L will employ an "Inspect/Maintain" process in the original cycle year for the particular circuit to ensure that the delay in the full circuit maintenance does not create undue safety and/or reliability issues. This "Inspect/Maintain" process will include a full circuit patrol by a person knowledgeable in the specifications of DP&L's vegetation management program. The patrol of the circuit will identify any vegetation conditions that may result in service interruptions prior to the full circuit maintenance to be performed the following year. These conditions will be mitigated as quickly as possible.

g. Substations

Substation Transformers

1. Program objectives

The goal of this program is ensure reliable operation and to extend the operating life of substation class transformers.

2. Overview of procedures

This program is condition-based and preventive in nature. In addition to the tasks listed below, condition-based and predictive maintenance is applied to transformers in the form of continuous monitoring of nitrogen pressure, LTC/main tank temperature differential, and main tank oil temperature (as applicable). Additional tasks such as internal visual inspections, megger test, etc. are performed as needed based on engineering judgment. Substation transformer loading is also continuously monitored to ensure that thermal limits are not exceeded. Routine scheduled tasks include the following:

a. ***Task Name*:** External Visual Inspection
***Frequency*:** Twelve times annually, with no inspection interval exceeding forty calendar days between inspections.
***Description*:** Check for oil leaks, ground faults, failed cooling fans, high temperature, high or low pressure, clogged or damaged grills, damaged gauges.

b. ***Task Name*:** Thermographic Imaging
***Frequency*:** Yearly
***Description*:** Check for hot spots due to loose connections.

c. ***Task Name*:** Dielectric Oil Breakdown Test of Transformer Main Tank
***Frequency*:** Annually. On a case by case basis, additional testing may be completed for diagnostic analysis (i.e. trending).
***Description*:** Test the dielectric strength of the oil. Complete maintenance activities as needed. Maintenance activities will be performed as a result of the oil's dielectric and moisture properties.

d. ***Task Name*:** Dielectric Oil Breakdown Test of Transformer LTC
***Frequency*:** Annually. On a case by case basis, additional testing may be completed for diagnostic analysis (i.e. trending).

***Description*:** Complete maintenance activities as needed. Maintenance activities will be performed as a result of the oil's dielectric and moisture properties.

e. ***Task Name*:** Perform Power Factor Test
***Frequency*:** Every seven years
***Description*:** Perform this test to check for insulation degradation.

3. **Identification of equipment examined**
   All substation transformers are included in this program.

4. **Justification for program schedule**
   Maintenance and inspection practices are based on engineering experience and industry practices. The criticality of equipment is determined based on the voltage class, system configuration and loading.

5. **Process of documenting and recording program activities**
   All data is tracked in a Computerized Maintenance Management System (CMMS) program. The CMMS system holds a Maintenance Task Table that shows historical and scheduled maintenance for each device. The system also generates and tracks maintenance and repair work orders.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   Repair versus replacement determination is made based on engineering judgment and life cycle cost. The CMMS program is an excellent tool for tracking reliability by equipment manufacturer and model. If CMMS data shows a pattern of problems or failures, the entire class of like equipment may be scheduled for replacement or repair.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of substation equipment, specific classes of equipment may be scheduled for replacement based on failure history or total owning cost.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Circuit Breakers

1. **Program objectives**
   The goal of this program is ensure reliable operation and extend the operating life of circuit breakers.

2. **Overview of procedures**

   a. ***Task Name*:** Operational Test
      ***Frequency*:** As needed to ensure breakers are operated at least once per year
      ***Description*:** Test to ensure proper operation. Repair or adjust as needed.

   b. ***Task Name*:** Visual Inspection

***Frequency*:** Twelve times annually, with no inspection interval exceeding forty calendar days between inspections.

***Description*:** Check for oil leaks, cracked or damaged bushings and other items depending on the type of unit. Repair or adjust as needed.

c. ***Task Name*:** Preventive Maintenance
***Frequency*:** Varies depending on type (i.e. oil, vacuum, SF6, etc.) and vintage[2]
***Description*:** Varies depending on type (i.e. oil, vacuum, SF6, etc.) and vintage

3. **Identification of equipment examined**
This program includes all substation circuit breakers.

4. **Justification for program schedule**
The breaker maintenance program is preventive in nature and methodology is based on company experience. The criticality of equipment is determined based on the voltage class, system configuration and loading.

5. **Process of documenting and recording program activities**
All data is tracked in a Computerized Maintenance Management System (CMMS) program. The CMMS system holds a Maintenance Task Table that shows historical and scheduled maintenance for each device. The system also generates and tracks maintenance and repair work orders.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
Repair versus replacement determination is made based on engineering judgment and life cycle cost. The CMMS program is an excellent tool for tracking reliability by equipment manufacturer and model. If CMMS data shows a pattern of problems or failures, the entire class of like equipment may be scheduled for replacement or repair.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of substation equipment, specific classes of equipment may be scheduled for replacement based on failure history or total owning cost.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Relays

[2] Effective 2020, DP&L will eliminate time travel testing on SF6 and vacuum circuit breakers.

1. **Program objectives**
   The goal of this program is ensure reliable operation of relays.

2. **Overview of procedures**
   This program is preventive in nature. The testing schedule is as follows:

   a. ***Task Name*:** Calibration and Trip Test
      ***Frequency*:** 345 kV and 138 kV – every six years for non-digital relays and every twelve years for digital relays,
      69 kV and 33 kV – every eight years for non-digital relays and every twelve years for digital relays,
      12 kV and 4 kV – every ten years for non-digital relays and every twelve years for digital relays,
      Under Frequency and Load Shed Relays – every 5 years for non-digital relays and every 10 years for digital relays.

      ***Description*:** Calibrate and test to ensure proper operation.

3. **Identification of equipment examined**
   All relays are included in the program.

4. **Justification for program schedule**
   Procedures are based on company experience and manufacturer documentation. Criticality is determined based on voltage class.

5. **Process of documenting and recording program activities**
   Calibration/trip test results are documented on Relay Field Test Cards. The most recent test results are kept on file for every relay on the system. The Computerized Maintenance Management System (CMMS) shows the overall program schedule and status.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   After reviewing test results, the decision to repair or replace is made based on engineering judgment and manufacturer specifications.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Substation Switches

1. **Program objectives**
   The goal of this program is to maintain the reliable operation of switches in substations.

2. **Overview of procedures**
   This program is preventive in nature.

3. **Identification of equipment examined**
   All substation switches are included in the program.

4. **Justification for program schedule**
   Equipment criticality is determined based on voltage class and system configuration.

   a. ***Task Name*:** Thermographic Inspection
      ***Frequency*:** Annually
      ***Description*:** Check for hot spots and repair or adjust as needed.

5. **Process of documenting and recording program activities**
   All data is tracked in a Computerized Maintenance Management System (CMMS) program. The CMMS system holds a Maintenance Task Table that shows historical and scheduled maintenance for each device. The system also generates and tracks maintenance and repair work orders.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   Repair versus replacement determination is based on company experience. If field personnel experience problems operating a particular switch, the switch will be maintained and lubricated. The CMMS program is an excellent tool for tracking reliability by equipment manufacturer and model. If CMMS data shows a pattern of problems or failures, the entire class of like equipment may be scheduled for replacement or repair.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of substation equipment, specific classes of equipment may be scheduled for replacement based on failure history or total owning cost.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

h. Voltage Regulators

1. Program objectives

The goal of this program is to maintain reliable operation of key components of the distribution system.

2. Overview of procedures

Distribution system device maintenance programs are primarily preventive in nature. The detailed procedures are outlined in the *'Distribution Maintenance and Inspection Programs Manual'*.

a. ***Task Name*:** Voltage Regulator Inspections
***Frequency*:** Biennially
***Description*:** Inspection that includes a control check, and visual check of the physical condition and indicator readings (min, max and current).

3. Identification of equipment examined

This program includes voltage regulators.

4. Justification for program schedule

Maintenance and inspection schedules for overhead distribution devices are based on a combination of manufacturer recommendations and company experience.

5. Process of documenting and recording program activities

Record keeping practices vary for each of the programs described below. At a minimum, inspections and deficiencies are documented and maintained.

6. Process for reviewing program results and making repairs/replacements based on those findings

The determination to repair versus replace varies for each component and is generally based on the judgment of qualified field personnel and engineering. Deficiencies that could reasonably be expected to endanger life or property shall be promptly repaired, disconnected or isolated. All remaining deficiencies that are likely to cause an outage shall be corrected within one year of the completion of the inspection or testing that originally revealed such deficiencies. All other remaining deficiencies that are not expected to endanger life or property or are not likely to cause an outage will be tracked until complete.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process

Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process. In the case of distribution system components, capital projects may be initiated based on the finding of field inspections.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**

   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

i. Transmission

Transmission Lines

1. Program objectives

The goal of this program is to maintain the reliability and safety of the electric transmission system including facilities ranging from 33kV to 345 kV.

2. Overview of procedures

This preventive program consists primarily of visual and infrared inspections of structures/poles, insulators, switches and conductors. Guidelines for each voltage class/type are as follows:

345 kV

a. ***Task Name*:** Helicopter Patrol
***Frequency*:** Quarterly
***Description*:** Look for mechanical problems, erosion and vegetation problems. Initiate corrective action as needed.

b. ***Task Name:*** Thermography
Frequency: As needed
Description: Check line switches for heating indicative of poor electrical connections. Identify "hot spots" and classify according to elevation above ambient temperature. Complete necessary repairs.

138 kV

a. ***Task Name*:** Helicopter Patrol or ground patrols for areas in Metro Dayton "No Fly" Zones.
Frequency: Quarterly
***Description*:** Look for mechanical problems, erosion and vegetation problems. Initiate corrective action as needed.

b. ***Task Name:*** Thermography
Frequency: As needed
Description: Check line switches for heating indicative of poor electrical connections. Identify "hot spots" and classify according to elevation above ambient temperature. Complete necessary repairs.

69 kV and 33 kV

a. ***Task Name*:** Helicopter Patrol or ground patrols for areas in Metro Dayton "No Fly" Zones.
***Frequency*:** Semiannually
***Description*:** Look for mechanical problems, erosion and vegetation problems. Initiate corrective action as needed.

b. ***Task Name:*** Thermography
Frequency: As needed
Description: Check line switches for heating indicative of poor electrical connections. Identify "hot spots" and classify according to elevation above ambient temperature. Complete necessary repairs.

Underground

a. ***Task Name*:** Cathodic Protection System Test (if applicable)
***Frequency*:** Yearly
***Description*:** Test the integrity of the corrosion protection on the steel pipe housing for the underground transmission cable. Initiate corrective action as needed.

3. Identification of equipment examined
This program includes transmission structures/poles, insulators, switches and conductors from 33kV through 345 kV.

4. Justification for program schedule
The National Electric Safety Code is used as a guideline to establish minimum requirements. Criticality of equipment is determined by voltage class (i.e. 345 kV lines are the most critical).

5. Process of documenting and recording program activities
All deficiencies are documented and maintained in a database.

6. Process for reviewing program results and making repairs/replacements based on those findings
The determination to repair or replace is based on the inspection findings combined with engineering judgment.

7. Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process
Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

Transmission Right of Way (Vegetation Management)

1. **Program objectives**
   The goal of this program is to maintain the reliability of the electric transmission system by preventing outages and equipment damage due to trees or other vegetation contacting the lines.

2. **Overview of procedures**

   a. ***Task Name*:** Line Clearance
   ***Frequency*:** Varies depending on line location, clearance requirements and species of vegetation present
   ***Description*:** Trim or remove trees and brush as needed. Clearance will vary based on the species of tree and the voltage class of the line.

   b. ***Task Name*:** Herbicide Application
   Frequency: As needed.
   Description: Herbicide is applied as needed.

   c. ***Task Name*:** Visual Inspection
   Frequency: "Walking patrols" are used to inspect the Metro Dayton "No Fly" Zones. These inspection patrols are scheduled three to four times per year.

   "Helicopter Patrols" are targeted as follows:

All 345kV circuits	Quarterly
All 138kV circuits	Quarterly
All 69kV circuits	Semi annually
All 33kV circuits	Semi annually

   ***Description*:** Visually inspect and identify any problems spots. Off-cycle trimming "hot-spotting" will be performed as needed to correct problem areas.

3. **Identification of equipment examined**
   All overhead transmission lines are included in the vegetation management program.

4. **Justification for program schedule**
   The vegetation management program is preventive in nature and the guidelines are based on company experience. Criticality of lines is determined based on voltage class and system configuration. DP&L also maintains and keeps current it's' Transmission Vegetation Management Program as required in NERC Standard FAC-003-1.

5. **Process of documenting and recording program activities**
   Program activities are recorded in a database.

6. **Process for reviewing program results and making repairs/replacements based on those findings**
   Information from field inspections is entered into the transmission line clearance database. This database is used to track the progress of all work from originating inspection to final inspection. This database is targeted for weekly updates. All completed work is inspected for quality control.

7. **Process for incorporating program findings into the company's capital planning and budgeting, and T&D system reliability process**
   Budgets and long range plans are continually updated as new information becomes available. Results from maintenance and inspection programs are one of many inputs into the capital planning and budgeting process.

8. **Process for reviewing the progress and effectiveness of the program and implementing change where needed**
   The adequacies of all maintenance and inspection programs are evaluated based on the results achieved. Program effectiveness is continually assessed and change is implemented as needed.

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Summary: Application to Amend the Company's Transmission and Distribution Inspection, Maintenance, Repair and Replacement Programs electronically filed by Mr. Robert J Adams on behalf of The Dayton Power and Light Company