



Staff Report

U-20169

August 10, 2018

Sally A. Talberg, Chairman
Norman J. Saari, Commissioner
Rachael A. Eubanks, Commissioner

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Executive Summary

On May 17, 2018, the Michigan Public Service Commission (Commission) issued an order in MPSC Docket No. U-20169 after a severe wind storm swept through southeastern lower-Michigan and the thumb area beginning May 4, 2018. High wind speeds, with gusts approaching 70 mph, resulted in several hundred downed wires, thousands of customer outages, and a confirmed electrocution fatality due to a downed wire on May 7, 2018. The Commission order was issued based on the concern that areas of DTE's electric distribution system are not able to provide safe and reliable service; therefore, the order was issued with a focus on safety to determine if system maintenance is contributing to safety hazards. DTE and, later, the Michigan Public Service Commission Staff (Staff) were directed to file reports. Staff was specifically directed to:

"... file an evaluation of DTE Electric's report. The Staff shall carefully examine the factual basis for assertions in the report, and the strength of the analysis and information provided by the company. The Staff's report shall include an analysis and recommendations, where necessary, regarding: (1) potential violations; (2) improvements to DTE Electric's method of transmitting and supplying electricity; (3) the strength and effectiveness of DTE Electric's procedures addressing downed wires (both regulatory and internal); and (4) the degree of adherence to the program of inspection required under the Commission's rules."

Overall, Staff believes that the DTE Electric report provided a fair review of what the Commission asked the Company to address. However, Staff does believe that there were areas within the Company's report that lacked detail and thus failed to address what the Commission order requested. Staff was not satisfied with how the Company addressed the Commission's concern "that parts of DTE Electric's distribution system are exhibiting an inability to routinely provide the level of safe and reliable service that is required by law" and the concern "with the operation of the 4.8 kV system and the question of whether it presents unique hazards." Staff issued a total of 68 questions and initiated meetings from July to early August to address areas of concern raised in the Commission's order that Staff believed the Company's report failed to address.

Staff's investigation included a review of the Company's distribution system, wire down procedures, and inspection program and identified potential violations. After reviewing the vegetation density results, the number of wire downs and outages, and the operations and maintenance (O&M) tree-trim spend amounts on the 4.8 kV system in the City of Detroit as part of the investigation, Staff has determined that there are areas within DTE Electric's distribution system that have experienced variable levels of tree-trim maintenance on an overhead circuit basis. Staff also finds that prior to 2015 "equipment" was used as the default cause for "unknown" outage causes to the customer's secondary service lines which leads Staff to believe that some of the outages caused by equipment in the 2013-2015 timeframe may not have been related to equipment. Staff is concerned with the 4.8 kV system as a whole given the fact that it is an ungrounded system and although the system is equipped with some ground alarm capabilities,

single-phased downed wires may not produce fault currents large enough to engage safety devices and remain energized. Staff believes that the system also presents unique hazards in the City of Detroit due to the amount of rear-lot construction, which significantly impacts accessibility to the entire system and the ability to perform maintenance, emergency response, and remediation efforts.

As a result of its investigation, Staff makes nine recommendations to the Company and recommendations to the Commission.

Introduction

On May 17, 2018, the Michigan Public Service Commission (Commission) issued an order in MPSC Docket No. U-20169 after a severe wind storm swept through southeastern lower-Michigan and the thumb area beginning May 4, 2018. High wind speeds, with gusts approaching 70 mph, resulted in several hundred downed wires, thousands of customer outages, and a confirmed electrocution fatality due to a downed wire on May 7, 2018. The Commission order was issued based on the concern that areas of DTE's electric distribution system are not able to provide safe and reliable service; therefore, the order was issued with a focus on safety to determine if system maintenance is contributing to safety hazards. DTE and, later, the Michigan Public Service Commission Staff (Staff) were directed to file reports. Staff was specifically directed to:

"... file an evaluation of DTE Electric's report. The Staff shall carefully examine the factual basis for assertions in the report, and the strength of the analysis and information provided by the company. The Staff's report shall include an analysis and recommendations, where necessary, regarding: (1) potential violations; (2) improvements to DTE Electric's method of transmitting and supplying electricity; (3) the strength and effectiveness of DTE Electric's procedures addressing downed wires (both regulatory and internal); and (4) the degree of adherence to the program of inspection required under the Commission's rules."

Incident Reporting – R 460.3804¹

Staff performed a five-year review and analysis of incidents² reported by DTE Electric in accordance with Michigan Administrative Rule 460.3804 from June 30, 2013 through June 30, 2018. The review, summarized in Figure 1 below, reflects a total of 20 reported incidents associated with DTE Electric's facilities within three distribution categories: 1) the 4.8 kV system in the City of Detroit, 2) the 4.8 kV system outside of the City of Detroit, and 3) the rest of the distribution system which is mostly comprised of the 8.3 kV and 13.2 kV systems³. Figure 1 shows that the 4.8 kV system in the City of Detroit had eight reported incidents versus six in each of the two remaining categories. Additionally, the data shows that over half of the total incidents reported on the 4.8 kV system were due to downed wires. Of the total downed wire incidents,

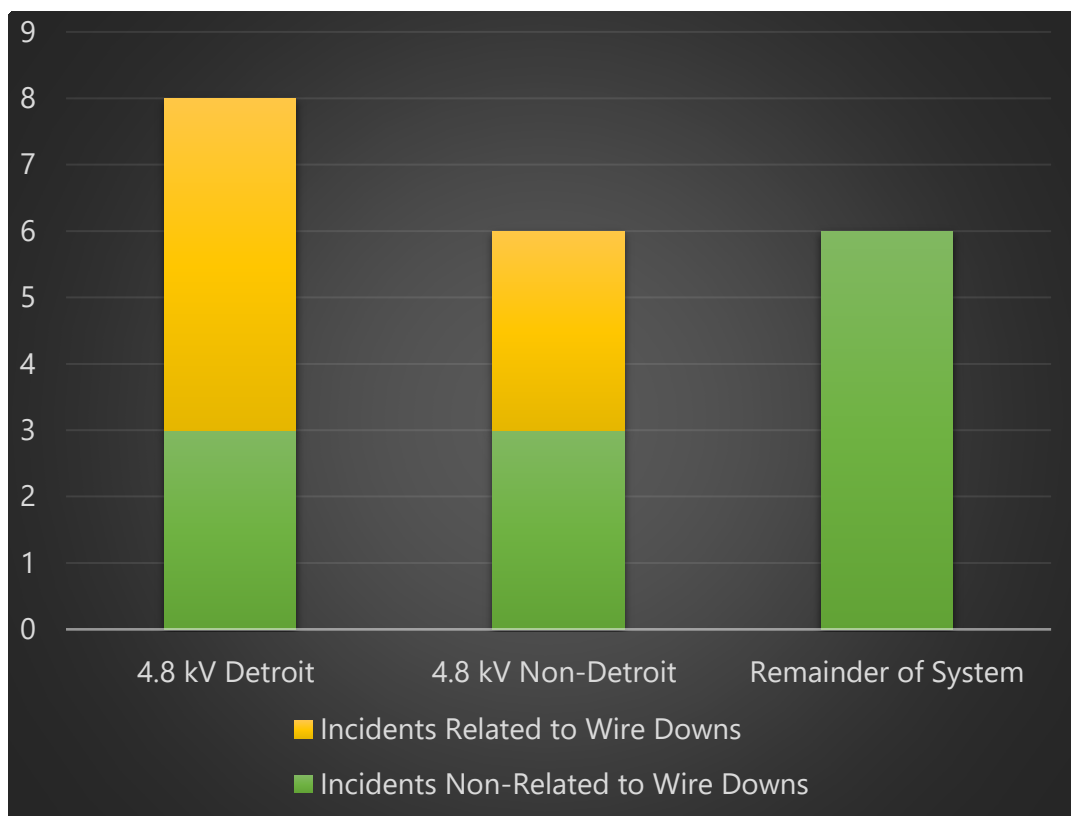
¹ Administrative Rule 460.3804 entitled "Accidents; notice to commission" states that "[e]ach utility shall promptly notify the commission of fatalities and serious injuries that are substantially related to the facilities or operations of the facilities."

² The locations and health status associated with the incidents was determined based on the information that was initially reported to Staff. Subsequent updates related to location or health status may not be reflected in the analysis.

³ Staff chose to display the data under these three categories to not only show how the 4.8 kV system compares to the rest of the system, but to also compare areas within the 4.8 kV system.

over 87% were related to storm events. The review also included an analysis of the percentage of incidents which resulted in fatal injury. For the 4.8 kV system in the City of Detroit, 100% of incidents resulted in fatal injury. For the 4.8 kV system outside the City of Detroit, approximately 83% of incidents resulted in fatal injury, and approximately 33% of incidents resulted in fatal injury for the remainder of the system.

Figure 1: DTE Incidents Reported Under R 460.3804 (June 30, 2013 - June 30, 2018)



DTE Report Evaluation

The Commission order directed DTE to file a report in MPSC Docket No. U-20169. The Commission's directive was made with a focus on safety to inform the Commission and address concerns "that parts of DTE Electric's distribution system are exhibiting an inability to routinely provide the level of safe and reliable service that is required by law" and "the operation of the 4.8 kV system and the question of whether it presents unique hazards" as provided below:

"The report shall detail the performance of DTE Electric's system during and after the May 4 windstorm event, including why outages occurred, how the utility responded, and whether changes should be implemented to reduce the potential for massive power outages, injury, or death. The report shall also provide a detailed examination of the utility's ongoing efforts to ensure compliance with the regulations listed above. The

report shall also include a description of DTE Electric's internal safety protocols, and an analysis of compliance with those protocols. The Commission is particularly interested in whether DTE Electric is in compliance with these rules and protocols on a daily basis, and whether the utility experiences a comparable degree of compliance across all geographic areas of its distribution system."

Overall, Staff believes that the DTE Electric report provided a fair review of what the Commission asked the Company to address. DTE provided an overview of the May 4th wind storm's intensity showing areas of the lower-peninsula that saw the highest impacts from the storm. The Company also provided an adequate overview of the impacts the May 4th storm had on its distribution system, providing the number of wire downs, customer outages, broken poles, and amount of wire replaced. Along with the storm analysis, the Company provided its response to the storm by explaining the staging and preparation to support restoration efforts, providing details on the specific numbers of restoration resources, mutual assistance contact timing, and restoration plan in order to meet Commission Rule requirements. The Company's internal protocols were summarized and demonstrated that the Company does have internal procedures to protect the public in a wire down event designed to reduce potential hazards that may endanger life or property. The Company also provided an overview of compliance with the regulations outlined by individually addressing each of the Commission Rules specified in the Commission order. Finally, Staff appreciated the fact that the Company acknowledges that there are areas for improvement by outlining three areas in detail; prevention of downed wires through maintenance and upgrades, further education and communication regarding downed wires, and responsiveness to reported downed wires during major storms.

However, Staff does believe that there were areas within the Company's report that lacked detail and thus failed to address what the Commission order requested. Staff was not satisfied with how the Company addressed the Commission's concern "that parts of DTE Electric's distribution system are exhibiting an inability to routinely provide the level of safe and reliable service that is required by law" and the concern "with the operation of the 4.8 kV system and the question of whether it presents unique hazards." The areas Staff believed to lack detail and analysis are:

- Analysis of why the large number of customer outages occurred, aside from the fact that the May 4th wind storm appeared to have been concentrated on DTE Electric's service territory.
- Analysis of compliance with internal safety protocols.
- Analysis of compliance across all geographic service distribution areas, as they relate to preventative maintenance programs.

Staff Investigation

Staff sought more information from the Company in its investigation through meetings and multiple questions and requests for clarification to further its analysis after DTE Electric's report

was issued. Staff's questions were designed to address areas of concern raised in the Commission's order that Staff believed the Company's report failed to address. The dates for each communication⁴ were as follows:

- July 9, 2018 – Questions 1-56 issued to the Company
- July 16, 2018 – Call to discuss Questions 1-56 issued to the Company
- July 20, 2018 – Responses to 1-56 (excluding 19) received from the Company
- July 24, 2018 – Questions 57-68 issued to the Company
- July 25, 2018 – Response to Questions 19, 57, 60-61, 63, 65, and 67-68 received from the Company
- July 27, 2018 – Remaining responses received from the Company
- August 2, 2018 – Meeting to review the downed wire procedures with the Company

Distribution System Investigation

Staff has a good understanding of how DTE Electric's distribution system supplies electricity to its customers, but looked more deeply at specific characteristics of the distribution system. In addition to what has already been conveyed through the Company's Distribution Operations Five-Year (2018-2022) Investment and Maintenance Plan in MPSC Docket No. U-18014, it was determined that the 4.8 kV system in the City of Detroit is mostly comprised of an ungrounded ringed system and is equipped with ground alarm capabilities at some substations within the city that provide the ability to send alarms if there is an equipment failure or a grounded downed wire situation to improve safety. On a per overhead circuit mile basis, it was determined that the 4.8 kV system in the City of Detroit has 80% rear-lot construction, which is approximately 20% more than the 4.8 kV system outside of the City of Detroit and the rest of the distribution system⁵. The rear-lot construction on the 4.8 kV system in the City of Detroit is often near alleyways, which are no longer maintained by the City of Detroit, making it difficult for DTE Electric to access the entire right-of-way to perform maintenance, emergency response, and remediation functions. Adding to the accessibility issue, city residents have encroached the right-of-way with additions such as sheds and fences. Staff has made site reviews to assist in its analysis as to what exists in the city.

DTE Electric's 4.8 kV system in the City of Detroit shows a higher-level of tree density per overhead line mile, as compared to the 4.8 kV system outside of the City of Detroit and the rest of the distribution system. This information was provided by an outside consultant (ECI). The vegetation management consultant's survey outlines that starting in 2017, the estimated tree density on the

⁴ See Appendix A for a full list of Staff questions and Company responses.

⁵ See Appendix A response to Question #2.

4.8 kV system in the City of Detroit is 297 trees per mile as compared to 172 trees per mile on the 4.8 kV system outside of the City of Detroit and 180 trees per mile on the rest of the distribution system⁶. Staff believes that the vegetation densities are generally proportional to the increased number of wire down and outage events in a given area. As a result, the 4.8 kV system in the City of Detroit experiences greater levels of wire down and outage events on an overhead circuit mile basis, compared to the remainder of the distribution system. Based on Staff's review of the O&M tree-trim spend over the past five-years⁷, it is evident that the 4.8 kV system has received a lower-level of spend on an overhead circuit mile basis compared to the rest of the distribution system. Staff is aware that the Company had to make a decision on its tree-trim cycle and spend based on its O&M dollar funding, but until recently the Company did not raise an issue of high tree densities in the City of Detroit until sometime late in 2017. It appears that the 4.8 kV system in the City of Detroit consists of approximately 8.5% of DTE's total electric system on an overhead line mile basis, but the 4.8 kV system has not received more than 8.5% of total tree trimming yearly funding in four of the past five-years. See response to Question #10 of Appendix A on past O&M tree-trim spend amounts. DTE Electric states it is currently able to achieve an 8.5-year effective tree-trim cycle based on the current funding levels as outlined on page 18 of DTE Electric's report in MPSC Docket No. U-20169.

Additionally, Staff also observed that the number of outage events caused by equipment failures on the 4.8 kV system saw a significant reduction beginning in 2015, specifically on equipment where one customer was interrupted⁸. The reduction in number of outage events caused by equipment is because DTE Electric began recording the default cause as "unknown" rather than "equipment" in 2015 which leads Staff to believe that some of the outages caused by equipment in the 2013-2015 timeframe may not have been related to equipment. The single-outage equipment causes are typically related to overhead service lines on the secondary system.

Furthermore, certain areas of DTE Electric's distribution system unexpectedly experience more outages than the rest of the system and require an immediate large amount of money to fix the problem. Plymouth and Ann Arbor areas are two examples. In the Plymouth area, DTE Electric met with the public to work on a plan to improve the reliability that was determined to require one million dollars to be spent. Additional reliability issues occurred within two months prompting the Company to change their mind and increased the anticipated spend amount to five million dollars to improve reliability. If further meetings with the public occur on reliability issues in this area or other areas of DTE Electric's service area, Staff should be invited.

⁶ See Appendix A response to Question #4.

⁷ See Appendix A response to Question #10

⁸ See Appendix A response to Question #6.

Wire Down Procedure Investigation

DTE Electric provided a summary of the wire down response process on pages 11-15 of DTE's report filed in MPSC Docket No. U-20169. As previously mentioned, Staff also met with the Company on August 2, 2018, to review DTE Electric's downed wire procedures as directed in the Commission order. During the meeting, multiple documents were reviewed and presented to Staff including informational packets, a memorandum, a training presentation, and guidelines. The Company made the appropriate personnel available to explain the Company's internal wire down response process in detail for both storm and normal "blue-sky-day" operations. Multiple questions were asked by Staff including, but not limited to, staffing and procedural details as they relate to wire down response. The purpose of a procedure is to establish a framework to ensure that there is a level of consistency regarding a specific task or function. Staff concluded that there is no definitive procedure which outlines the entire wire down response function of the Company to ensure consistent response by all employees to reduce the safety hazards posed from a downed wire. Given the critical importance of wire down response and remediation, Staff believes it would be difficult to maintain a level of consistency in response by all employees across the system if the Company is relying on multiple documents to support the wire down response safety function. DTE also shared during the meeting that they have limited the use of wire guard personnel due to recent changes to procedures. In Staff's opinion, this policy fails to provide adequate protections to the general public's safety during severe weather situations. In the Commission's December 4, 2014 order in MPSC Docket No. U-17542 regarding the 2013 Ice Storm, the Commission encouraged the utilities to meet the goal of 2,500 trained wire down personnel. The intent of this goal was undeniably to improve the public safety during wire down events. DTE's current approach of training and maintaining the 2,500 wire guards while minimizing their deployment fails to promote the intended protection to the public at large from the order.

Inspection Program Investigation

DTE provided a maintenance overview and explained each of the maintenance programs related to the Company's electric distribution system in the report filed in MPSC Docket No. U-20169. Staff also requested further details related to the inspection programs to determine the Company's level of compliance with internal inspection programs related to each electric distribution equipment category. Staff was informed that the Company currently has a 14% critical asset inspection backlog, which has improved since 2014⁹, and the Company may intentionally defer inspections if there is planned decommissioning or replacement work in the near future for that equipment.

⁹ See Appendix A response to Question #19

Potential Violations

The Commission's authority to make and prescribe regulations is granted through Act 419 of 1919.

MCL 460.55 states in part that:

The commission shall also have authority to make and prescribe regulations for the conducting of the business of public utilities, subject to the jurisdiction thereof, and it shall be the duty of every corporation, joint stock company, association or individual owning, managing or operating any such utility to obey such rules and regulations. Any such corporation, joint stock company, association or individual refusing or neglecting so to do, or refusing or neglecting to make any report required hereunder, shall be liable to a penalty of not less than 100 dollars nor more than 1,000 dollars...

Administrative Rules entitled "Technical Standards of Electric Service"¹⁰ and "Service Quality and Reliability Standards for Electric Distribution Systems"¹¹ provide the Michigan Public Service Commission the authority to enforce operations and maintenance rules to ensure public safety. As a result of the investigation, Staff has identified the following violations.

R 460.3801

R 460.3801 entitled "Protective measures." states that:

Each utility shall exercise reasonable care to reduce the hazards to which its employees, its customers, and the general public may be subjected.

In its investigation, Staff determined that DTE Electric has failed to develop wire down procedures which clearly outline the Company's internal wire down response and remediation functions to ensure consistency across all employees and to reduce the hazards to which its employees, its customers, and the general public may be subjected. Staff determined that the internal wire down response process, as described to Staff on August 2, 2018, was not adequately supported by the Company's documents. Multiple documents are used to inform the employees of the appropriate steps in the response process makes it difficult to carry out consistent response for wire downs across the entire system. Staff determined that there is no definitive standalone procedure which outlines the entire wire down response function of the Company to ensure consistent response by all employees to reduce the safety hazards posed from a downed wire.

¹⁰ Authority granted through Public Act (PA) 3 of 1939 (MCL 460.4 and MCL 460.6), PA 106 of 1909 (MCL 460.557), and PA 419 of 1919 (MCL 460.55).

¹¹ Authority granted through PA 3 of 1939 (MCL 460.4 and MCL 460.6), PA 106 of 1909 (MCL 460.557), PA 141 of 2000 (MCL 460.10p) PA 380 of 1965 (MCL 16.103, MCL 16.109 and MCL 16.331), and PA 419 of 1919 (MCL 460.55).

R 460.3501

R 460.3501 entitled "Electric plant; construction, installation, maintenance, and operation pursuant to good engineering practice required." states that:

The electric plant of the utility shall be constructed, installed, maintained, and operated pursuant to accepted good engineering practice in the electric industry to assure, as far as reasonably possible, continuity of service, uniformity in the quality of service furnished, and the safety of persons and property.

R 460.3504 entitled "Electric plant inspection program." states that:

Each utility shall adopt a program of inspection of its electric plant to ensure safe and reliable operation. The frequency of the various inspections shall be based on the utility's experience and accepted good practice. Each utility shall keep sufficient records to verify compliance with its inspection program.

In its investigation, Staff determined that DTE Electric has established electric equipment preventative maintenance inspection frequencies¹² to ensure safe and reliable operation based on the utility's experience. DTE Electric currently has a 14% critical asset inspection backlog and has failed to adhere to the Company's preventative maintenance program for assets since 2014. This backlog started at 29% in 2014 and is currently on pace to be eliminated by approximately 2022. At the current rate, it is possible that critical assets in the distribution system could be eight-years past the Company's preventative maintenance inspection cycle dates.

R 460.3505

R 460.3505 entitled "Utility line clearance program." states in part that:

Each utility shall adopt a program of maintaining adequate line clearance through the use of industry-recognized guidelines. A line clearance program shall recognize the national electric safety code standards that are adopted by reference in R 460.811 et seq.

R 460.813 entitled "Standards of good practice, adoption by reference." states in part that:

Parts 1, 2, and 3 and sections 1, 2, 3, and 9 of the national electrical safety code, 2017 edition (ANSI-C2-2017), are adopted by reference in these rules as standards of accepted good practice.

¹² Exhibit 6.2.1 within DTE Electric's Five-Year Investment and Maintenance Plan filed in MPSC Docket No. U-18014 shows the established inspection frequency for each asset in the distribution system.

Part 2, Section 21 of the National Electric Safety Code (NESC) entitled "General requirements" states in part that:

218. Vegetation management

A. General

1. Vegetation management should be performed around supply and communication lines as experience has shown to be necessary. Vegetation that may damage ungrounded supply conductors should be pruned or removed.

In its investigation, Staff relied on the Company's consultant (ECI) to demonstrate that the 4.8 kV system in the City of Detroit has an estimated vegetation density of 297 trees per mile. The Company states it has experienced a higher level of wire downs and outages on a per overhead circuit miles basis over the past five-years. Staff determined from its review that over the past five-years the 4.8 kV system, as a whole, has received a lower level of O&M tree-trim funding on an overhead circuit basis compared to the rest of the distribution system. DTE Electric prioritizes circuits for trimming based on reliability impacts, wire down reductions, number of years since the last tree-trim, and alignment with construction and capital programs¹³. However, the causes of wire down events are not tracked, nor was the Company able to provide average tree-trim cycles broken down into the three distribution categories -the 4.8 kV system in the City of Detroit, the 4.8 kV system outside of the City of Detroit, and the rest of the distribution system. Staff believes that the historic average tree-trim cycles could have been provided at a circuit level had the Company appropriately maintained the information needed to support the tree-trim prioritization criteria previously mentioned. Based on the tree densities on the 4.8 kV system in the City of Detroit and the fact that approximately 49% of circuit miles on the 4.8 kV system in the City of Detroit are beyond the Company's five-year targeted tree-trim cycle, it is evident that the current tree trimming maintenance program has failed to allow the Company to maintain adequate clearance around the distribution and service lines as experience has shown to be necessary.

R 460.723(1) and R 460.723(2)

R 460. 721 entitled "Duty to plan to avoid unacceptable levels of performance" states that:

An electric utility shall plan to operate and maintain its distribution system in a manner that will permit it to provide service to its customers without experiencing an unacceptable level of performance as defined by these rules.

¹³ See Appendix A response to Question #10.

R 460.723 entitled "Wire down relief requests." states that:

- 1) It is an unacceptable level of performance for an electric utility to fail to respond to a request for relief of a non-utility employee guarded downed wire at a location in a metropolitan statistical area within 240 minutes after notification at least 90% of the time under all conditions.
- (2) It is an unacceptable level of performance for an electric utility to fail to respond to a request for relief of a non-utility employee guarded downed wire at a location in a non-metropolitan statistical area within 360 minutes after notification at least 90% of the time under all conditions.

In its investigation, Staff determined that DTE Electric has failed to comply with the wire down relief requirements in metropolitan and non-metropolitan areas in calendar year 2017 and from January 1, 2018 through June 30, 2018. Figure 2¹⁴ below outlines the achieved percentages from 2017 and the first half of 2018.

Figure 2: DTE R 460.723 Compliance

	2017	January 1, 2018 - June 30, 2018
R 460.723(1)	84%	86%
R 460.723(2)	76%	61%

Staff Findings and Recommendations

After reviewing the vegetation density results, the number of wire downs and outages, and the O&M tree-trim spend amounts on the 4.8 kV system in the City of Detroit, Staff has determined that there are areas within DTE Electric's distribution system that have experienced variable levels of tree-trim maintenance on an overhead circuit basis. Staff also finds that prior to 2015 "equipment" was used as the default cause for "unknown" outage causes to the customer's secondary service lines which leads Staff to believe that some of the outages caused by equipment in the 2013-2015 timeframe may not have been related to equipment. Staff is concerned with the 4.8 kV system as a whole given the fact that it is an ungrounded system and although the system is equipped with some ground alarm capabilities, single-phased downed wires may not produce fault currents large enough to engage safety devices and remain energized. Staff believes that the system also presents unique hazards in the City of Detroit due to the amount of rear-lot

¹⁴ DTE files annual reports in MPSC Docket No. U-12270 to update Staff on compliance under the service quality and reliability standards. The 2017 percentages are outlined in the 2017 annual report and the 2018 percentages were provided in the Company's response to Question #54.

construction, which significantly impacts accessibility to the entire system and the ability to perform maintenance, emergency response, and remediation efforts.

As a result of its investigation, Staff makes the following recommendations.

Company Recommendations

1) Staff recommends that DTE Electric track the causes of wire down events and number of years since the last tree-trim at a circuit level in to more effectively prioritize tree-trim circuits within the distribution system. Responses to Staff's questions revealed that the Company does not track the causes of wire downs, nor was the Company able to provide the average tree-trim cycle broken down into the three distribution categories - 4.8 kV Detroit, 4.8 kV Not-Detroit, and the rest of the distribution service territory.

2) Staff recommends that DTE Electric consider an O&M tree-trim spend on a risk-based analysis for its distribution circuits, not on a mile basis. The 4.8 kV system in the City of Detroit should be receiving over 8.5% of the tree-trim spending budget until the outages or number of tree related events is significantly reduced. Responses to Staff's questions also revealed that approximately 49% of the circuits on the 4.8 kV system within the City of Detroit are beyond the five-year trim cycle.

3) Staff recommends that DTE Electric establish a procedure to permit quicker reporting of incidents to Staff in accordance with R 460.3804 identifying at a minimum the location, size of distribution system, when the incident occurred, and health status. DTE reported the May 7, 2018, fatal injury to Staff on May 17, 2018. The 10-day time period is not considered by Staff to be prompt notification of a fatality. Staff realizes that all of the pertinent details may not be available soon after the incident, but Staff should be notified once the Company is aware of the incident by telephone or email and a detailed report can be filed at a later date.

4) Staff recommends that DTE Electric continue to aggressively perform inspections including infrared surveys, foot patrols, and pole top maintenance inspections to identify equipment failures in order to strengthen circuits and improve safety, reliability, and resiliency.

5) Staff recommends that DTE Electric consider alternatives to rear-lot construction on the 4.8 kV system in the City of Detroit and work to make the now encroached alleyways accessible for maintenance, emergency response, and remediation efforts. The results of the ECI survey demonstrate that the 4.8 kV system in the City of Detroit is comprised of 80% rear-lot construction which has also experienced encroachment from city residents after the City of Detroit has ceased maintenance of the alleys. The combination of rear-lot construction, the City ceasing maintenance on of alleyways, and encroachment issues make it challenging for DTE Electric to operate and maintain the electric distribution system.

6) Staff recommends that DTE Electric participate in an initiative involving multiple electric utilities to improve the downed wire response process and timing. Over half of DTE Electric's incidents reported in accordance with R 460.3804 on the 4.8 kV system have been related to downed wires,

and Company responses to Staff's questions revealed that the wire down response times from the time the Company is notified to the time the Company's employee arrives to the site are long. Staff acknowledges that the Company has committed to re-evaluating the downed wire response protocols and has started a benchmarking initiative as outlined on page 28 of DTE Electric's report filed in MPSC Docket No. U-20169 that Staff is willing to participate in to improve the downed wire response process.

7) Staff recommends that DTE Electric develop a single wire down response procedure to ensure consistency in response efforts throughout the Company. DTE's wire down response protocol consisted of multiple documents making it difficult for employees to establish consistency throughout the company as it relates to wire down response efforts.

8) Staff recommends that DTE track the wire down response times during outages of more than 75,000 customers using the information available through the OMS system identifying at a minimum the initial response time to make safe, time the work is completed, and amount of time the employee was on standby at the site.

9) Staff recommends that DTE Electric expedite the elimination of the 2018 inspection backlog for critical assets that have exceeded the Company's established maintenance cycle. DTE Electric had a 29% inspection backlog in 2014 for critical assets within the electric distribution system and has reduced the backlog to 14% in 2018. Although the backlog is improving, DTE is on pace to eliminate the critical asset inspection backlog by approximately 2022, which would total eight-years to eliminate the backlog.

Commission Recommendations

1) **Potential Violations:** Staff recommends four areas of potential violation to the Commission identified under Administrative Rules 460.3801, 460.3501, 460.3505, and 460.723 related to the wire down response procedures, adherence to the Company's preventative maintenance program, vegetation management, and wire down relief requests. The details for each identified issue are described in the Potential Violations section of the report.

2) **Improvements to DTE Electric's Method of Transmitting and Supplying Electricity:** Staff recommends the Commission require DTE to review the multiple alternatives to decrease or even eliminate the level of rear-lot construction on the 4.8 kV system in the City of Detroit due to the accessibility challenges and obstacles of abandoned and encroached alleyways which were once accessible. The review should also include a feasibility analysis.

3) **Strength and Effectiveness of DTE Electric's Procedures Addressing Downed Wires:** Staff has identified the potential violation under R 460.3801 related to the downed wire response procedures. Staff believes the procedures need to be strengthened by providing further detail. The wire down response process was described to Staff, but the procedures did not always reflect the level of detail as described. Staff also believes the procedures would become more effective

and improve consistency across all response employees if the multiple documents were combined to establish one standalone procedure outlining the entire protocol.

4) **Degree of Adherence to the Program of Inspection Required Under the Commission**

Rules: Staff has identified the potential violation under R 460.3501 related to the lack of adherence to the Company's preventative maintenance program. Staff determined that DTE Electric currently has a 14% critical asset inspection backlog that is on pace to be eliminated by approximately 2022.

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Appendix A – Staff Questions and DTE Electric Responses

DTE Electric Company
Case No. U-20169

Auditor: T. Becker
Request No: TJB-1.1 **Page:** 1 of 1

Request:

1. Exhibit 3.4 on page 27 of DTE's five-year distribution plan outlines that DTE Distribution has a total of 28,459 overhead circuit miles. Please confirm the total overhead miles in each category.
 - a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The primary overhead miles for each category is provided in the table below.

Category	Primary Overhead Miles
4.8 Detroit	2,412
4.8 non-Detroit	14,372
8.3 & 13.2	11,675
Total	28,459

DTE Electric Company
Case No. U-20169

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Request:

2. Please confirm the percentage of overhead circuit miles which are rear-lot construction into the following categories.
 - a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

Through the Company's system density assessment, the Company had the vegetation management consultant, ECI, sample the percentage of rear-lot versus roadway accessible circuit miles. Through this assessment the Company estimates rear-lot construction as follows:

- a. 4.8 kV Detroit – 80%
- b. 4.8 kV non-Detroit – 63%
- c. Rest of distribution service territory (8.3 kV and 13.2 kV) – 60%

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Request:

3. Please compare the cause of outages/trouble events over the past five years on the APPOL1346 circuit on the 4.8 kV system in the City of Detroit and the BUNRT8404 circuit on the 4.8 kV system in Warren (both of which had tree trimming in 2013 and 2014 respectively).

Response:

DTE records the cause of outage events, but not the cause of trouble (non-outage) events. For each of the two circuits, the numbers of outage events by cause and the total number of trouble events for the previous five years are listed in tables below.

Note: Both circuits were trimmed per the legacy clearance circle practice. Reviewing pre- and post-trimming data indicates the legacy clearance circle practice did not improve the reliability performance of these two circuits.

	Number of Outage and Trouble Events by Year						
Circuit	Outage Cause/Trouble	2013	2014	2015	2016	2017	Avg
APPOL1346	Cause = Trees	5	12	16	11	25	14
APPOL1346	Cause = Equipment	27	32	16	12	15	20
APPOL1346	Cause = All Other	4	5	3	4	2	4
APPOL1346	Cause = Unknown	1	0	11	14	20	9
APPOL1346	Total Outage	37	49	46	41	62	47
APPOL1346	Total Trouble	119	139	129	135	164	137
APPOL1346	Total Outage & Trouble	156	188	175	176	226	184

	Number of Outage and Trouble Events by Year						
Circuit	Outage Cause/Trouble	2013	2014	2015	2016	2017	Avg
BUNRT8404	Cause = Trees	1	3	1	1	3	2
BUNRT8404	Cause = Equipment	14	13	9	15	6	11
BUNRT8404	Cause = All Other	7	3	6	3	12	6

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BUNRT8404	Cause = Unknown	1	1	3	8	5	4
BUNRT8404	Total Outage	23	20	19	27	26	23
BUNRT8404	Total Trouble	55	127	82	78	95	87
BUNRT8404	Total Outage & Trouble	78	147	101	105	121	110

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Request:

4. Please describe the overall vegetation density based on vegetation density surveys performed over the past 12 months in the following categories. Please describe how these surveys are documented, how long the records are retained, what information is captured, and planned remediation timeframe if deficiencies are discovered.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The Company performed an approximate 10% tree density assessment on approximately 23,000 miles since September 2017 to better forecast the scope of work and associated costs for the annual tree trimming plan. The Company's vegetation management consultant, ECI, surveyed the identified circuits, capturing estimates for the following information: Number of trims, number of removals, area of brush, the property type, accessibility, potential crew types to conduct the work, location of construction, and wire configurations.

The data was captured electronically and analyzed using Excel. The records will be retained for seven years, per the Company's records retention policy.

Through this density assessment, the Company estimates the following tree densities:

- a. 4.8 kV Detroit – 297 trees/mile
- b. 4.8 kV non-Detroit – 172 trees/mile
- c. Rest of distribution service territory (8.3 kV and 13.2 kV) -180 trees/mile

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Request:

5. In DTE Electric's testimony in Case Number U-18255, Mr. Whitman's testimony states 46% of customers are served by 4.8 kV and 53% of customers are served by 13.2 kV lines. (Whitman pg. 8). The five-year distribution shows on page 153 that DTE Electric's 4.8 kV system has experienced 55% of Trouble events and 62% of Wire downs events. For the last five years, please provide the number of trouble events and wire down events broken down into the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The numbers of trouble events and wire down events for the last five years are provided in the tables below. These numbers reflect the initial trouble call data and are not verified or modified after-the-fact. DTE responds to all wire down events regardless of the ownership of the wire.

	Number of Trouble Events (Includes Wire Down Events)				
Year	4.8 kV Detroit	4.8 kV Non-Detroit	4.8 kV System	8.3 & 13.2 kV System	Distribution System
2013	62,343	72,263	134,606	115,844	250,450
2014	72,707	82,854	155,561	123,081	278,642
2015	63,257	72,774	136,031	106,930	242,961
2016	60,530	74,532	135,062	111,718	246,780
2017	79,203	91,517	170,720	135,961	306,681
Average	67,608	78,788	146,396	118,707	265,103

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	Number of Wire Down Events				
Year	4.8 kV Detroit	4.8 kV Non-Detroit	4.8 kV System	8.3 & 13.2 kV System	Distribution System
2013	6,378	6,426	12,804	9,624	22,428
2014	8,537	8,238	16,775	10,285	27,060
2015	5,816	5,603	11,419	6,019	17,438
2016	4,997	5,393	10,390	6,334	16,724
2017	8,470	8,777	17,247	10,824	28,071
Average	6,840	6,887	13,727	8,617	22,344

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Request:

6. Please provide information on the causes of the wire down events and trouble events on the 4.8 kV system in the City of Detroit compared to the rest of the 4.8 kV system over the past five years.

Response:

DTE records the cause of outage events, but not the cause of wire down events or non-outage trouble events in the Outage Management System. The numbers of outage events by cause are provided in the table below.

Beginning in 2015, single customer outage events began being recorded with a default “unknown” cause code instead of “equipment”. This explains the decline in single customer equipment outage events and increase in outage events with the cause of unknown.

		Outage Events by Cause		
Cause	Year	4.8 kV Detroit	4.8 kV Non- Detroit	4.8 kV Total
Trees	2013	5,135	4,722	9,857
	2014	6,339	5,765	12,104
	2015	4,988	4,695	9,683
	2016	4,601	4,518	9,119
	2017	6,606	6,488	13,094
	Average	5,534	5,238	10,771
Equipment [Events where Customers Interrupted > 1]	2013	317	718	1,035
	2014	348	697	1,045
	2015	399	970	1,369
	2016	449	1,306	1,755
	2017	534	1,288	1,822
	Average	409	996	1,405
Equipment [Events where Customers Interrupted = 1]	2013	8,010	6,415	14,425
	2014	8,497	6,630	15,127
	2015	4,451	4,239	8,690
	2016	2,549	2,761	5,310
	2017	1,766	2,076	3,842
	Average	5,055	4,424	9,479

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Unknown	2013	418	572	990
	2014	211	344	555
	2015	1,690	1,393	3,083
	2016	2,095	2,705	4,800
	2017	3,401	3,825	7,226
	Average	1,563	1,768	3,331
All Other	2013	2,672	2,552	5,224
	2014	2,459	2,560	5,019
	2015	2,015	2,389	4,404
	2016	1,910	2,032	3,942
	2017	977	1,597	2,574
	Average	2,007	2,226	4,233
Total	2013	16,552	14,979	31,531
	2014	17,854	15,996	33,850
	2015	13,543	13,686	27,229
	2016	11,604	13,322	24,926
	2017	13,284	15,274	28,558
	Average	14,567	14,651	29,219

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Request:

7. The five-year distribution report states that one-third of the outage events are caused by trees. For each of the last five years, provide the number of outages caused by tree interference in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The numbers of outage events caused by tree interference in three categories of the system are provided in the table below:

Outage Events by Trees				
Year	4.8 kV Detroit	4.8 kV Non- Detroit	4.8 kV Total	8.3 & 13.2 kV Total
2013	5,135	4,722	9,857	8,230
2014	6,339	5,765	12,104	8,048
2015	4,988	4,695	9,683	6,746
2016	4,601	4,518	9,119	7,088
2017	6,606	6,488	13,094	10,707
Average	5,534	5,238	10,771	8,164

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Request:

8. For each of the last five years, provide the number of times a line crew was dispatched in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The numbers of times that an overhead line crew and/or a tree trimming crew was dispatched to an event on the 4.8 kV system in the City of Detroit, the rest of the 4.8 kV system, and the rest of distribution system for the last five years are provided in the table below.

	Number of Events Line Crews were Dispatched (Overhead and/or Tree Trim Crew)				
Year	4.8 kV Detroit	4.8 kV Non-Detroit	4.8 kV System	8.3 & 13.2 kV System	Distribution System
2013	50,551	56,420	106,971	87,718	194,689
2014	57,070	62,906	119,976	91,919	211,895
2015	51,689	58,154	109,843	80,807	190,650
2016	49,640	59,630	109,270	84,984	194,254
2017	61,353	70,721	132,074	103,048	235,122
Average	54,061	61,566	115,627	89,695	205,322

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Request:

9. Please describe the tree trimming programs in the following categories over the past five years including the tree trim specification(s) used.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

Tree trimming specifications have been applied consistently throughout the Company's service territory. The Company currently trims circuits to maintain clearance for one five-year cycle worth of growth, which, on average, necessitates ten feet of clearance to the outermost conductor. The required clearance is species-specific.

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Request:

10. Please provide the O&M tree trimming dollars spent in the following categories in each of the past five years. These amounts shall include O&M spending only and not include capital projects. If the O&M spend was decreased as compared to previous years on the 4.8 kV in the City of Detroit, please explain.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

	Tree Trimming Maintenance O&M Spend (\$ Million)		
Year	4.8 kV Detroit	4.8 kV Non-Detroit	Rest of the Distribution System
2013	2.2	13.3	23.5
2014	2.8	5.6	21.4
2015	2.8	13.6	33.5
2016	4.1	9.3	37.3
2017	1.6	10.8	44.2

The Company does not select circuits for tree trimming based upon municipality, and the resultant decrease in spend in the City of Detroit between 2016 and 2017 is simply the outcome of the Company's prioritization methodology. The Company prioritizes circuits for trimming based on reliability impacts, wire down reductions, the number of years that have passed since the last trim, and alignment with construction/capital programs. Resource balancing across the service territory is also considered to ensure resources are available to respond to unplanned events in a timely manner.

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Request:

11. Please describe the overall results of any infrared surveys performed over the past 12 months in the following categories. Please describe how these surveys are documented, how long the records are retained, what information is captured, and planned remediation timeframe if deficiencies are discovered.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

A database is maintained that documents each circuit that received an infrared survey and a record of each hot spot or other defective condition identified. For each hot spot or defect, data is collected regarding the location, equipment description, temperature rise above ambient and an infrared photo. The database currently has records for at least ten years.

Upon identification of a significant hotspot or defect, the situation is immediately called into general supervisors in service centers to follow up and address. For minor hotspots or defects, the work is held until other planned work (e.g. PTM or capital work) is scheduled for the circuit.

Infrared Patrols – 12 Months Ending June 30, 2018		
Category	Number of Circuits with Infrared Patrols	Number of Hotspots or Defects Identified
4.8 kV Detroit	38	16
4.8 kV non-Detroit	74	9
8.3 & 13.2 kV	11	1
Total	123	26

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Request:

12. Please provide the number of circuits which have been trimmed to the ETP specification since 2015 in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

Since 2015, the company has trimmed 346 circuits as part of the ETP. The following chart shows the number of circuits trimmed on the 4.8 kV in the City of Detroit, the remainder 4.8 kV system that is not in Detroit, and the remainder of the distribution system:

	Number of Circuits Trimmed as Part of the ETP		
Year	4.8 kV Detroit	4.8 kV Non-Detroit	Remaining Distribution System
2015	10	13	4
2016	9	57	83
2017	15	70	85

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Request:

13. Please provide the current average tree trimming cycle for circuits in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

Average trimming cycles are not separable for the three categories requested. In 2017, the Company cleared 3,601 miles which equates to an eight and a half-year cycle. Based on funding and miles trimmed in 2015-2017 the system is on a nine-year cycle.

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Request:

14. Pages 24 and 25 of DTE's report filed on June 29, 2018, state "[a] subset of the poles is further tested based on a schedule determined by pole age, type, treatment, and location. Based on the inspection and testing results, poles that do not have the required strength remaining are flagged for either replacement or reinforcement." Please describe how the "schedule" is determined and how DTE ensures that the testing is evenly distributed throughout the entire system.

Response:

The Pole and Pole Top Hardware Program selects circuits for inspection each year based on time since last inspection. Circuits with longest time since last inspection are prioritized for inspection program.

Poles selected for the Pole and Pole Top Hardware Program are either visually inspected or further tested. The criteria for further pole testing is predominantly by pole age. For instance, poles in service for 19 years or less have a low probability of failure and are mostly visually inspected. In addition, a small number of poles may not be tested due to factors such as pole type, treatment, or environmental conditions (aka location).

- Pole Type: Steel or concrete poles are only visually inspected.
- Treatment: All cellon treated poles (average age of 48 years) are replaced without further testing. The Company's analysis and industry benchmark indicate cellon treated poles experience scattered decay and ground-line testing is not a reliable indicator of overall decay.
- Environmental conditions (aka location): Poles that are not readily accessible for ground-line testing because they are surrounded by a wall or in water are visually inspected and replaced when poles reach expected end-of-life – the industry standard life expectancy of a pole is 40 years for pine and 50 years for cedar.

Poles are inspected and tested based on criteria discussed above, regardless the service centers or communities they serve.

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Request:

15. Please provide the average PTM cycle for circuits in the following categories.

- a. 4.8 kV Detroit
- b. 4.8 kV non-Detroit
- c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The average PTM cycle (based on the last five years of inspections) for each category is shown in the table below.

	4.8 kV Detroit	4.8 kV non- Detroit	8.3 & 13.2 kV
Average Pole Inspection Cycle	9	11	11

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Request:

16. DTE Energy Electric 2017 Pole Inspection report filed on March 23, 2018 identified poles visually inspected through the PTM program (33,976), poles inspected through the PTM program with additional pole testing (29,254), poles inspected through the joint use process (39,226), and poles replaced on trouble (4,112). For each of the categories mentioned above, please classify the percentage of inspections/tests into the following categories.

- a. 4.8 kV Detroit
- b. 4.8 kV non-Detroit
- c. Rest of distribution service territory (8.3 kV and 13.2 kV)
- d. Other

Response:

The pole inspections by type and category for 2017 are shown in the table below. Please note that 2017 inspection data only is not representative of how pole inspections have been distributed among different parts of the DTE system.

	Poles Inspected in 2017	Percent of Poles Inspected in each Category		
Inspection Type		4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
PTM Visual Inspections	33,976	4%	50%	46%
PTM Testing	29,254	4%	56%	40%
Joint Use Inspections	39,226	7%	28%	65%
Poles Replaced on Trouble	4,112	19%	31%	50%
Total	106,568	6%	43%	51%

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Request:

17. The May 4th wind storm resulted in 542 broken poles. Please provide the number of broken poles into the following categories and identify the number of poles in each category which exceeded the 10-12 year inspection frequency.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)
 - d. Other

Response:

The estimated broken pole distribution in the three categories during May 4th wind storm is shown in the table below. DTE was not able to identify the number of poles in each category which exceeded the 10-12-year inspection frequency.

Approximately 13% of DTE poles are located in 4.8 kV Detroit area, 31% located in 4.8 kV non-Detroit area and 56% located in the rest of system.

	4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
Percentage of Broken Poles	14%	40%	46%

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Request:

18. Please identify the number of broken poles during the April 15, 2018 ice storm, and provide the number of broken poles into the following categories identify the number of poles in each category which exceeded the 10-12 year inspection frequency.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)
 - d. Other

Response:

The April 15th ice storm resulted in approximately 112 broken poles. The estimated broken pole distribution in the three categories during April 15th ice storm is shown in the table below. DTE was not able to identify the number of poles in each category which exceeded the 10-12-year inspection frequency. Approximately 13% of DTE poles are located in 4.8 kV Detroit area, 31% located in 4.8 kV non-Detroit area and 56% located in the rest of system.

	4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
Percentage of Broken Poles	21%	33%	46%

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Request:

19 .Exhibit 6.2.1 in DTE's five-year distribution plan outlines general inspection cycles for substation and distribution system categories. Prior to May 4, 2018, please provide the percentage of inspections which exceeded the general inspection cycle (since the most recent inspection) for each asset in the following categories. Please include all assets in the exhibit that apply.

- a. 4.8 kV Detroit
- b. 4.8 kV non-Detroit
- c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The table below contains the percentage of units by distribution electrical equipment type that exceeds the stated inspection cycle (or inspection backlog) based on the completion of the 2018 preventative maintenance program. Asset inspections are generally done to adhere to inspection cycles regardless of asset geographical locations. Assets may have inspections intentionally deferred/canceled due to planned work in the near-term where the assets will be decommissioned or replaced. Assets may also have inspections intentionally deviate from time-based inspection cycles due to results from Predictive Maintenance Program (e.g., Substation Regulators, Single Tap Substations).

DTE has made significant strides in reducing the inspection backlog. For critical assets, the current backlog is 14% compared to 29% in 2014. Assets with highest criticality to the electrical system are prioritized for backlog reduction.

Note that "n/a" is not applicable, meaning the assets do not exist in the referenced categories.

	Percent of Distribution Electrical Assets Exceeding Inspection Cycle			
Asset	Inspection Cycle (Years)	4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
Distribution Breakers	3/10/12	3%	2%	3%
Substation Predictive Maintenance Inspections (SPdM)	3	0%	0%	0%
Substation Regulators	10	18%	26%	n/a
Single Tap Substations	10	n/a	45%	10%

Network Banks	5	0%	12%	n/a
13.2 kV Enclosed Capacitor Banks	1	n/a	n/a	0%
Relays	5/7/10	13%	21%	28%
Substation Batteries	1	0%	0%	0%
Transformers & Regulators (Dissolved Gas Analysis)	1	0%	0%	0%
Overhead Distribution SCADA Reclosers and Pole Top Switches	4/8	0%	1%	24%
Primary Switch Cabinets	5/10/15	1%	0%	7%
DTE Equipment in High Rise Structure	20	0%	0%	0%
Overhead Capacitor & Regulator Controls	1	4%	3%	2%
Overhead Distribution Device (SCADA) Batteries	4	0%	1%	24%
Voltage Controls	1	0%	0%	0%

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Request:

20. Exhibit 6.2.1 in DTE's five-year distribution plan outlines general inspection cycles for substation and distribution system categories. For each of the assets, please describe how the inspections are documented, how long these documents are retained, what information is captured, and planned remediation timeframe if deficiencies are discovered.

Response:

Each asset class has an inspection form that lists the required electrical and mechanical tests and measurements for the asset. Most of the inspection forms are paper, but a few are electronic.

As part of the inspection process, any identified abnormalities are resolved. Some repairs are made at the time of the inspection; others are scheduled for future repair if the parts or resources are not immediately available. If parts are no longer available or the repair costs are excessive, the asset will be scheduled for replacement.

The inspection form is completed by the field crew. Engineering reviews the completed form and verifies the inspection/repairs. A record of the inspection is entered into the work management system (Maximo). The inspection forms are retained for 11 years per DTE's Corporate Policy OP6 for Electric Transmission & Distribution records.

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Request:

21. Please identify the number of circuits which are not compliant with current DTE Electric design standards in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

DTE Electric design standards evolve over time. Any asset or circuit installation is compliant with the design standards at the time of the construction.DTE Electric Company Auditor:

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22. For the 4.8 kV hardening program and demand failures work on the 4.8 kV system in Detroit are all poles, conductors, insulators, and cross-arms installed to meet the current DTE Electric design standards? Are these standards to the 13.2 kV design?

Response:

All new assets installed today are based on the current DTE design standards. The current DTE design standards for distribution system are for 13.2 kV design (see the response to question #21). Poles, conductors, insulations and cross-arms installed today as part of the 4.8 kV hardening program or any other projects/programs meet the current DTE's design standards.

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Request:

23. Please provide DTE's wire down response procedure for blue sky and storm events outlining what is required from the time a wire down is reported until the wire down is resolved including documentation requirements associated with the responses.

Response:

As outlined on DTE's U-20169 Response submitted to the commission on June 29 2018, the Company responds to downed wires reported by the public via mobile app, web or phone, substation ground alarms, and reports by Police and Fire departments.

For wires reported by the public or Police and Fire, the first part of the process is creating a wire down event in the system of record (InService). This event is generated by Customer Service if reported by phone call or automatically generated if reported by the app, web or the Company's interactive voice response (IVR) system. The generated event includes a unique identification number, the timestamp of creation, the type of event, the system details (circuit, service center, region, etc.)

In Blue Sky, generally the resource dispatched is an overhead crew, which confirm the hazard and remediate it (either by repair or cutting the wire in the clear). The crew is dispatched, arrives at the site and marks the job as complete in InService. Each of these actions generates a time stamp in InService.

In Storm, when the volume of reported downed wires is higher, the first available resource dispatched when overhead crews are not immediately available is either an Electric Field Operations (EFO) resource or a Public Safety (Secure First) resource. Their role is to identify the hazard, secure the site by taping and alerting the neighboring residents, relieving the Police and Fire on site (in the case of wires reported by Police and Fire departments), and standing-by if the wire meets stand-by criteria. After the EFO or Secure First team has secured the area, the hazard is then removed by the first available overhead crew. Similarly to what happens in Blue Sky, all crews are dispatched, arrive at the site and mark the job as complete in InService.

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Request:

24. Please provide DTE's procedure for remediating a wire down (if not captured in the previous question's request) including the targeted response time to remediate the wire down and documentation requirements.

Response:

See question 23 for remediation of downed wires.

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Request:

25. Page 15 of DTE's report filed on June 29, 2018 indicates that "[c]andidates are required to pass a test and to perform 50 hours of supervised field experience paired with a qualified mentor in order to become fully qualified." Please describe how these records are documented, how long the records are retained, and what information is captured.

Response:

Each candidate attending the training is required to sign an attendance sheet which is then collected by the instructor. The list of names is then cross-referenced with the results of the tests in order to track who successfully completed the training. The attendance and the successful completion of the test is maintained in the Company's training system.

Hours worked in the field (up to a total of 50) are manually tracked by Distribution Operation Emergency Preparedness and Response Team utilizing an Excel spreadsheet.

The Company generally retains training records for 70 years.

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Request:

26. Please provide the average wire down response times (from notification to dispatch) for the April 15th and May 4th storms in 2018 in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The average response time (time to dispatch) for the two storms was as follows:

Time to Dispatch Confirmed Downed Wires				
	Reported Downed Wires Apr 15 / May 4	Confirmed Downed Wires Apr 15 / May 4	April 15th storm	May 4th storm
4.8kV Detroit	1,772 / 668	959 / 419	246 minutes	94 minutes
4.8kV non-Detroit	1,478 / 1039	970 / 613	190 minutes	141 minutes
Rest of territory	931 / 1,173	611 / 728	94 minutes	176 minutes
Total	4,181 / 2,880	2,540 / 1,760		

Note that reported downed wires along with confirmed downed wires in the above table do not exactly match other reports. The differences are made up by miscellaneous downed wire events that are not associated with the above categories (e.g., City of Detroit PLD wires, subtransmission, etc.)

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Request:

27. Please provide the average wire down response times (from dispatch to arrival) for the April 15th and May 4th storms in 2018 in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The average response time (time to arrive) for the two storms was as follows:

	Time to Arrive to Confirmed Downed Wires			
	Reported Downed Wires Apr 15 / May 4	Confirmed Downed Wires Apr 15 / May 4	April 15th storm	May 4th storm
4.8kV Detroit	1,772 / 668	959 / 419	58 minutes	31 minutes
4.8kV non-Detroit	1,478 / 1,039	970 / 613	54 minutes	47 minutes
Rest of territory	931 / 1,173	611 / 728	30 minutes	58 minutes
Total	4,181 / 2,880	2,540 / 1,760		

Note that reported downed wires along with confirmed downed wires in the above table do not exactly match other reports. The differences are made up by miscellaneous downed wire events that are not associated with the above categories (e.g., City of Detroit PLD wires, subtransmission, etc.)

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Request:

28. Please describe the pre-storm preparation and first responder stationing in an effort to ensure that employees are able to respond efficiently to wire downs and trouble events during the storm. Does increased trouble calls change the stationing for the response employees?

Response:

As illustrated in the U-20169 response, first responders include EFO as well as Secure First resources.

Given the hazard represented by strong winds, we do not station employees in the field as the weather event moves across the territory.

EFO is comprised of Field Employees which are dispatched to the event closest to their location utilizing geotagging capability of the Company's mapping system.

Secure First resources are generally non-field employees. The Company's Public Protection dispatch function dispatches employees to their closest event, utilizing an app that employees are required to download on their mobile device.

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Request:

29. Page 14 of DTE's report filed on June 29, 2018, states that "[i]f the downed wire cannot be identified within 4 hours of dispatch, the substation breaker is opened to de-energize the entire circuit." Of the 3,016 wire down reports during the May 4, 2018 wind storm, please identify how many were not identified within four hours and confirm that all circuits were de-energized if the downed wire was not identified within four hours. Please describe why circuits were not de-energized that met the aforementioned criteria.

Response:

Note that the Company policy for de-energizing circuits (i.e., intentionally opening the breaker after four hours of unsuccessful patrolling for the wire) only applies when a ground alarm is detected.

In total 37 circuits were intentionally de-energized.

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Request:

30. Page 14 of DTE's report filed on June 29, 2018, states that "[i]f the downed wire cannot be identified within 4 hours of dispatch, the substation breaker is opened to de-energize the entire circuit." Please confirm the number of wire down reports for the April 15, 2018 ice storm, and identify how many were not identified within four hours and confirm that all circuits were de-energized if the downed wire was not identified within four hours. Please describe why circuits were not de-energized that met the aforementioned criteria.

Response:

4,269 downed wire reports in the April 15th storm.

In total 45 circuits were de-energized due to not being able to find the downed wire on the system.

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Request:

31. Page 8 of DTE's report filed on June 29, 2018, indicates that the May 4th wind storm resulted in 1,811 confirmed wire downs. Please break down the causes of these wire downs in the percent of the total.

Response:

DTE does not track cause codes for non-outage events, this includes downed wire cases.

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Request:

32. Please provide the number of confirmed wire downs during the April 15, 2018 ice storm and break down the causes of these wire downs in the percent of the total.

Response:

The April 15th, 2018 ice storm resulted in 2,620 confirmed downed wires.

DTE does not track cause codes for wire down events.

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Request:

33. Page 8 of DTE's report filed on June 29, 2018, indicates that the May 4th wind storm resulted in 1,811 confirmed wire downs. Please provide the number of wire downs in the following categories with percent of total.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

This question is answered in DTE's response to questions #26 and #27.

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Request:

34. Please provide the total confirmed wire downs during the April 15, 2018 ice storm and provide percentages in the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)
 - d. Other

Response:

This question is answered in DTE's response to questions #26 and #27.

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Request:

35. Of the 1,811 confirmed wire downs during the May 4, 2018 wind storm, please compare the number of wire downs which met the “stand-by criteria” with the number of wire downs which actually received stand-by assistance (wire guard) in accordance with the stand-by criteria. Please identify the percentage of wire downs which met the “stand-by criteria that did not receive a wire guard in accordance with the procedures.

Response:

As outlined in DTE’s U-20169 response, our current process has been enhanced to address wire downs that meet stand-by criteria by either performing the repair or cutting the wire in the clear. This is done by sending the nearest overhead crew and if necessary pulling them from an outage to go remediate the downed wire. No wire guards were used during the May 4, 2018 storm.

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Request:

36. Please provide the number of confirmed wire downs during the April 15, 2018 ice storm, please compare the number of wire downs which met the “stand-by criteria” with the number of wire downs which actually received stand-by assistance (wire guard) in accordance with the stand-by criteria. Please identify the percentage of wire downs which met the “stand-by criteria that did not receive a wire guard in accordance with the procedures.

Response:

As outlined in DTE’s U-20169 response, our current process has been enhanced to address wire downs that meet stand-by criteria by either performing the repair or cutting the wire in the clear. This is done by sending the nearest overhead crew and if necessary pulling them from an outage to go remediate the downed wire. No wire guards were used during the April 15, 2018 storm.

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Request:

37. Page 8 of DTE's report filed on June 29, 2018, indicates that the May 4th wind storm resulted in 1,811 confirmed wire downs out of 3,016 reported in the field. Please explain the approximately 40% of the reported wire downs being false alarms and how that was confirmed by DTE.

Response:

The approximately 40% of false alarms is a result of multiple issues: duplicate reports by multiple people, non-DTE wires, misreported by customers and other miscellaneous reasons. DTE investigates each of the reported downed wires by sending a field resource or first responder.

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Request:

38. Based on after outage even review, please explain what DTE has done to improve wire down relief and response efforts since the April 2018 ice storm and the May 2018 wind storm.

Response:

As outlined in DTE's response to U-20169 the Company has undertaken to evaluate areas for improvement. Those areas are:

- a. Prevention of downed wires and outages is best accomplished through the solutions detailed in the Five-Year Plan. Continuing to execute and accelerate this plan around tree trimming and infrastructure improvements will provide for much improved safety and reliability
- b. Further education and communication to all stakeholders regarding the dangers of downed wires.
- c. Advance, through the use of new technologies, the responsiveness of the public protection program to even more quickly address reported downed wires especially during major storms.

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Request:

39. Page 12 of DTE's report filed on June 29, 2018, states that "[w]ire down reports are received by DTE Electric's Central Dispatch, which assigns and dispatches the appropriate crews." Please confirm that all outage reports (i.e. phone, online, AML, etc.) are dispatched through Central Dispatch. Please also confirm that Central Dispatch is the only dispatch location within the state for DTE.

Response:

All outage reports are dispatched through Central Dispatch, which is the only dispatch location for outages in the state for DTE.

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Request:

40. Please explain DTE's internal wire down relief targets (in minutes) in metropolitan and non-metropolitan areas and explain how blue sky days and catastrophic conditions may change this target.

Response:

DTE's internal wire down relief targets are aligned with the Commission targets to respond to a request for relief of a non-utility employee guarded downed wire at a location in a metropolitan statistical area within 240 minutes and within 360 minutes in a non-metropolitan area after notification at least 90% of the times.

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Request:

41. Please provide a breakdown for SAIFI and SAIDI information for 2017 and 2018 for the following categories with MED's days.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The following tables show the breakdown for reliability indices for 2017 and 2018 YTD June 30 for the three categories with MED's days. These tables also contain information requested in question 43.

	2017 All Conditions (including MEDs)			2018 YTD June 30 All Conditions (including MEDs)		
Metric	4.8 kV Detroit	4.8 kV non- Detroit	8.3 & 13.2 kV	4.8 kV Detroit	4.8 kV non- Detroit	8.3 & 13.2 kV
SAIFI	0.23	0.33	0.83	0.15	0.19	0.43
SAIDI minutes	272	338	452	99	123	142
CAIDI minutes	1,205	1,024	542	655	648	327

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Request:

42. Please provide a breakdown for SAIFI and SAIDI information for 2017 and 2018 for the following categories without MED's days.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The following tables show the breakdown for reliability indices for 2017 and 2018 YTD June 30 for the three categories without MED's days. These tables also contain information requested in question 44.

	2017 Excluding MEDs			2018 YTD June 30 Excluding MEDs		
Metric	4.8 kV Detroit	4.8 kV non- Detroit	8.3 & 13.2 kV	4.8 kV Detroit	4.8 kV non- Detroit	8.3 & 13.2 kV
SAIFI	0.14	0.20	0.65	0.09	0.11	0.33
SAIDI minutes	40	50	106	17	22	46
CAIDI minutes	295	246	163	186	202	139

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Request:

43. Page 2 of DTE's reliability and power quality report issued on March 29, 2018 in U-16065 identifies SAIFI, SAIDI, and CAIDI reliability performance over the past 10 years for all weather. Year 2017 had the worst performance in the past 10 years in all categories. Please provide the 2017 SAIFI, SAIDI, and CAIDI performance broken down into the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

See the response to question #41.

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Request:

44. Page 4 of DTE's reliability and power quality report issued on March 29, 2018 in U-16065 identifies SAIFI, SAIDI, and CAIDI reliability performance over the past 10 years excluding MEDs. Please provide the 2017 SAIFI, SAIDI, and CAIDI performance broken down into the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

See the response to question #42.

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Request:

45. For each of the past five years, what amount of capital and O&M spending was made in the following categories?
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

Generally, capital and O&M spend is not tracked on a circuit basis and therefore DTE Electric cannot provide response to this question.

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Request:

46. Page 7 of DTE's report filed on June 29, 2018, shows that there were 254,867 actual customer outages. Of these outages, how many customers were not restored within 60 hours? Please provide the number of customers not restored within 60 hours into the following categories.

- a. 4.8 kV Detroit
- b. 4.8 kV non-Detroit
- c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The number of customers restored and not restored within 60 hours for the May 4, 2018 wind storm are shown in the table below. The data show that DTE met the MPSC Service Quality and Reliability Standard of restoring 90% or more of customers within 60 hours under catastrophic conditions in each category.

May 4, 2018 Wind Storm – Number of Customers Restored									
	Within 60 Hours			Beyond 60 Hours			Total		
Bus kV	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total
4.8	52,900	82,430	135,330	8	6	14	52,908	82,436	135,344
8.3 & 13.2	355	119,154	119,509	0	14	14	355	119,168	119,523
Total	53,255	201,584	254,839	8	20	28	53,263	201,604	254,867
May 4, 2018 Wind Storm – % of Customers Restored									
	Within 60 Hours			Beyond 60 Hours			Total		
Bus kV	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total
4.8	99.98%	99.99%	99.99%	0.02%	0.01%	0.01%	100%	100%	100%
8.3 & 13.2	100%	99.99%	99.99%	0%	0.01%	0.01%	100%	100%	100%

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Request:

47. Please confirm the number of actual customer outages during the April 15, 2018 ice storm. Of these outages, how many customers were not restored within 60 hours? Please provide the number of customers not restored within 60 hours into the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

The number of customers restored and not restored within 60 hours for the April 15, 2008 ice storm are shown in the table below. The data show that DTE met the MPSC Service Quality and Reliability Standard of restoring 90% or more of customers within 60 hours under catastrophic conditions in each category.

April 15, 2018 Ice Storm – Number of Customers Restored									
	Within 60 Hours			Beyond 60 Hours			Total		
Bus kV	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total
4.8	85,739	95,518	181,257	5,498	2,798	8,296	91,237	98,316	189,553
8.3 & 13.2	365	97,160	97,525	0	1,898	1,898	365	99,058	99,423
Total	86,104	192,678	278,782	5,498	4,696	10,194	91,602	197,374	288,976
April 15, 2018 Ice Storm – % of Customers Restored									
	Within 60 Hours			Beyond 60 Hours			Total		
Bus kV	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total	Detroit	Non- Detroit	Total
4.8	93.97%	97.15%	95.62%	6.02%	2.85%	4.38%	100%	100%	100%
8.3 & 13.2	100%	98.08%	98.09%	0%	1.92%	1.91%	100%	100%	100%

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Request:

48. Please provide results of R 460.722(a)-(c) from January 1, 2018 to June 30, 2018.

Response:

Performance to R 460.722(a)-(c) for YTD June 30, 2018 is shown in the table below. The data show that DTE met the MPSC Service Quality and Reliability Standard for service restoration for each rule.

R 460.722(a)-(c) Performance 2018 YTD June 30	
Rule	Percent of Customers Restored within the Specified Time Frame
R 460.722(a) Restore not less than 90% of customers within 36 hours under all conditions	96%
R 460.722(b) Restore not less than 90% of customers within 60 hours under catastrophic conditions	98%
R 460.722(c) Restore not less than 90% of customers within 8 hours under normal conditions	92%

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Request:

49. DTE's 2017 service quality and reliability annual report in U-12270 indicates that 4% of DTE's circuits have experienced 5 or more same circuit interruptions in a 12-month period. Please provide the number of circuits which have experienced 5 or more of the same circuit repetitive interruptions in the 2017 12-month period for the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

R 460.702 Rule 2(s) of Case U-12270 states that "... at its option, an electric utility may report on specific identifiable circuit segments rather than whole circuits ...". DTE uses distribution transformers rather than whole circuits. The numbers of circuit segments (distribution transformers) with customers experiencing five or more interruptions are shown in the table below. DTE's system has a total of approximately 440,000 distribution transformers.

Number of Circuit Segments with 5 or More Interruptions in 2017			
4.8 kV Detroit	4.8 kV Non-Detroit	8.3 & 13.2 kV	Total
1,078	3,044	14,792	18,914

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Request:

50. For the May 4, 2018 wind storm, please identify the duration for each time the online outage map was not available for customers to view. Please also explain how the mapping software updates the outage information and the frequency of the updates. How has DTE ensured that the map is still available when traffic is higher than average?

Response:

During the May 4th wind storm, the DTE Energy outage map was continuously available to the customer. There were no service interruptions.

Based on experience during previous catastrophic storms, DTE Energy developed approach to make the outage map more resilient to periods of high customer traffic. The approach includes caching data from the source system and is driven by the number of customers impacted by the event.

During normal "Blue Sky" scenarios and storms impacting less than 50,000 customers, outage data for outage map is extracted every 15 minutes from the DTE Energy Outage Management System (OMS) and then loaded into the GIS system for display on the Outage Map. This data is then aggregated and plotted at an individual outage level.

During storms impacting greater than 50,000 customers, the outage map is switched to show a rendered overlay image of all individual outages in the GIS system, rather than pulling each individual outage image. This map provides the same outage information as the "Blue Sky" map but at a lower visual resolution and is refreshed every 30 minutes. This change is done to manage the traffic going to the GIS system, and prevent it from experiencing traffic related performance issues.

Both the "Blue Sky" and Storm Maps have a legend indicating the last time map data was updated.

During the May 4 storm, the map was available via the website until we reached the 50,000 customer threshold, at approximately 1:00PM. At approximately 1:00PM, we switched from the individual outage map to the map with image overlay. The image overlay approach was used until the number of customer outages went below the threshold of 50,000.

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Request:

51. Please explain any work DTE is doing to enhance the outage mapping system to ensure that customers have access to the up-to-date outage map at all times.

Response:

The approach taken to make the DTE Energy Customer Outage Map more resilient to high traffic events was implemented for the May 4th Wind Storm and will continue to be used for future outage events.

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Request:

52. Figure 6 on page 13 of DTE's report filed on June 29, 2018, outlines the number of reported wire downs per hour on May 4th and 5th. Please provide the average customer call answer time and call blockage factor (as a percentage) for hours 13- 15 on May 4th.

Response:

The average customer call answer time was 18 seconds between 13:00 and 15:00 on May 4th. The call blockage factor is 0.18% and a total of 72 calls were blocked between 13:00 and 15:00 on May 4th.

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Request:

53. Table 4 on page 26 of DTE's report filed on June 29, 2018, summarizes the 2017 compliance with Rule 723. Please provide a table outlining the results of Rule 460.723(1) and (2) for the May 4th wind storm and the April 15th ice storm.

Response:

Performance to Rule 460.723(1) and (2) for the May 4th wind storm and the April 15th ice storm are shown in the table below. Each of these storms was catastrophic per the U-12270 definition "... service interruptions for 10% or more of a utility's customers."

Contributing factors to the overall response rate are the volume of Police/Fire events, the time required to mobilize, and the travel time to the more remotely located service area, especially if road conditions are hazardous.

Rule 460.723(1) and (2): Police/Fire Standing By Performance 2018 YTD June 30 Catastrophic Storms (10% or more customers interrupted)		
Rule	April 15, 2018 Storm	May 4, 2018 Storm
Relieve 90% of Police/Fire Standing By cases within 240 minutes in Metropolitan Areas	73%	55%
Relieve 90% of Police/Fire Standing By cases within 360 minutes in Non- Metropolitan Areas	86%	34%

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Request:

54. Please provide the results of R 460.723(1) and (2) from January 1, 2018 to June 30, 2018 broken down into the following categories.
- a. 4.8 kV Detroit
 - b. 4.8 kV non-Detroit
 - c. Rest of distribution service territory (8.3 kV and 13.2 kV)

Response:

Performance to Rule 460.723(1) and (2) from January 1, 2018 to June 30, 2018 are shown in the tables below (all weather and excluding catastrophic storms). Catastrophic storms typically have a negative impact on performance due to the volume of Police/Fire events, the time required to mobilize, and the travel time to the more remotely located service area.

For DTE, only the northern-most service center (North Area Energy Center) is considered non-metropolitan by R 460.702 Rule 2(n) of Case U-12270.

Rule 460.723(1) and (2): Police/Fire Standing By Performance 2018 YTD June 30				
Rule	4.8 kV Detroit	4.8 kV non- Detroit	8.3 & 13.2 kV	Total
Relieve 90% of Police/Fire Standing By cases within 240 minutes in Metropolitan Areas	84%	85%	87%	86%
Relieve 90% of Police/Fire Standing By cases within 360 minutes in Non-Metropolitan Areas	n/a	63%	56%	61%

Rule 460.723(1) and (2): Police/Fire Standing By Performance 2018 YTD June 30 Excluding Catastrophic Storms (10% or more customers interrupted)				
Rule	4.8 kV Detroit	4.8 kV non- Detroit	8.3 & 13.2 kV	Total
Relieve 90% of Police/Fire Standing By cases within 240 minutes in Metropolitan Areas	92%	94%	95%	94%
Relieve 90% of Police/Fire Standing By cases within 360 minutes in Non-Metropolitan Areas	n/a	86%	100%	89%

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Request:

55. Please provide the results of R 460.724(a) and (b) for the duration of the May 4, 2018 wind storm as they relate to customer calls.

Response:

Performance to R 460.724(a) and (b) (Average Customer Call Answer Time and Call Blockage Factor) for the May 4, 2018 wind storm are shown in the table below. The data shows DTE met the average customer call answer time standard during May 4, 2018 wind storm.

Rule 460.724(a) and (b) May 4, 2018 Wind Storm - Performance	
Average Customer Call Answer Time Standard < 90 seconds	Call Blockage Factor Standard <= 5 %
29 seconds	0%

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Request:

56. Please the results of R 460.724(a) and (b) for the duration of the April 15, 2018 ice storm as they relate to customer calls.

Response:

Performance to R 460.724(a) and (b) (Average Customer Call Answer Time and Call Blockage Factor) for the April 15, 2018 ice storm are shown in the table below. The data shows DTE met the average customer call answer time standard during April 14, 2018 ice storm.

Rule 460.724(a) and (b) April 15, 2018 Ice Storm - Performance	
Average Customer Call Answer Time Standard < 90 seconds	Call Blockage Factor Standard <= 5 %
28 seconds	0%

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Request:

57. Please provide the most recent vegetation management consultant, ECI, report as referred to in Questions #2 and #4.

Response: Please see the attachment named U-20169 TJB-2.57 ECI report.

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Request:

58. Please provide tables showing the information in the response to Question #16 for the 2013-2016 DTE Electric Pole Inspection reports.

Response:

The DTE Electric pole inspection results for 2013-2016 are contained in the following four tables.

	Poles Inspected in 2016	Percent of Poles Inspected in each Category		
Inspection Type		4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
PTM Visual Inspections	50,583	5%	28%	67%
PTM Testing	35,370	5%	33%	62%
Joint Use/Planned Work Inspections	29,280	14%	30%	56%
Poles Replaced on Trouble	2,978	21%	30%	49%
Total	118,211	8%	30%	62%

	Poles Inspected in 2015	Percent of Poles Inspected in each Category		
Inspection Type		4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
PTM Visual Inspections	20,682	34%	20%	46%
PTM Testing	30,294	33%	8%	59%
Joint Use/Planned Work Inspections	30,333	13%	28%	59%
Poles Replaced on Trouble	1,970	24%	29%	47%
Total	83,279	26%	19%	55%

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	Poles Inspected in 2014	Percent of Poles Inspected in each Category		
Inspection Type		4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
PTM Visual Inspections	23,513	21%	6%	73%
PTM Testing	28,739	27%	14%	59%
Joint Use/Planned Work Inspections	48,883	19%	29%	52%
Poles Replaced on Trouble	969	23%	27%	50%
Total	102,104	22%	19%	59%

	Poles Inspected in 2013	Percent of Poles Inspected in each Category		
Inspection Type		4.8 kV Detroit	4.8 kV non-Detroit	8.3 & 13.2 kV
PTM Visual Inspections	31,352	12%	33%	55%
PTM Testing	43,875	17%	39%	44%
Joint Use/Planned Work Inspections	14,276	40%	55%	5%
Poles Replaced on Trouble	930	15%	31%	54%
Total	90,433	19%	39%	42%

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Request:

59. The response to Questions #35 and #36 indicate that there were no wire guards used for the April 15, 2018 and May 4, 2018 storms. Please identify how many wire downs met the stand-by criteria that were not repaired or cut in the clear for each storm and explain why a wire guard was not utilized.

Response:

All downed wires that met stand-by criteria were repaired or cut in the clear. Wire guards were not utilized because as stated previously in questions 35 and 36, the nearest crew is dispatched to the wire immediately. If there is no crew available, then one is pulled from the nearest outage. See response to question 64 for further details on the Company's wire down procedures.

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Request:

60. The response to Question #45 indicates that capital and O&M spend is not tracked on a circuit basis. Please identify how the historical spend is tracked and provide the amount of capital and O&M spend for each of the past five years in each of the respective tracking categories.

Response:

DTE Electric makes capital and maintenance investments based on the prioritization methodology detailed in the Company's Five-Year Investment and Maintenance Plan submitted to MPSC on January 31, 2018. Programs and projects are prioritized based on their customer benefit cost scores to address the most critical asset and system issues. For certain programs, such as pole and pole top maintenance, tree trimming, and preventive maintenance, program spend is allocated to adhere to program cycles for the entire system regardless of geographical locations.

The capital and O&M spend by category for each of the past five years is provided in the attachment named U-20169 TJB-2.60.

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Request:

61.Regarding the response to question #3, do both circuits consist of rear-lot construction?

Response: Yes, both APPOL1346 and BUNRT8404 have rear-lot construction. A desk-top estimate indicates APPOL1346 has approximately 75% rear-lot construction and BUNRT8404 has approximately 40% rear-lot construction.

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Request:

62. Regarding the response to question #13, the response states that “[a]verage trimming cycles are not separable for the three categories requested.” Is this due to a lack of documentation and recordkeeping, lack of the ability to retrieve this information through the management system, or both? Based on the response to question #10, it appears as though the number of years that have passed since the last tree trim is used to prioritize trimming.

Response: Average cycle time is not a metric specifically tracked because it is not a component of our tree trimming prioritization. As stated in question #10, the Company prioritizes circuits for trimming based on reliability impacts, wire down reductions, the number of years that have passed since the last trim, and alignment with construction/capital programs. Resource balancing across the service territory is also considered to ensure resources are available to respond to unplanned events in a timely manner. Although the data in the charts can be used to calculate an average cycle time, it is not representative of the targeted cycle length. We would like to meet to discuss this data and nuances in terminology further.

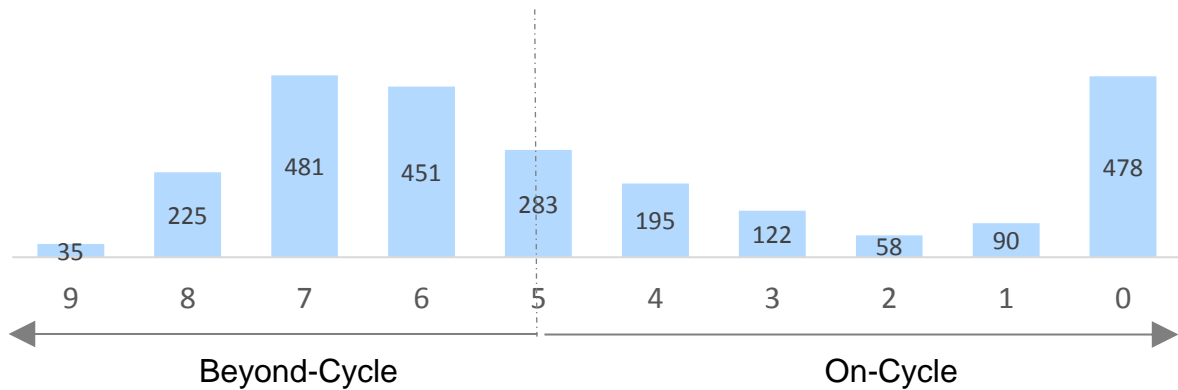
The following charts show the number years that have past since the last trim for the 4.8 kV miles in the City of Detroit, the remainder the miles on the 4.8 kV system that are not in Detroit, and the miles on the remainder of the distribution system. The charts are representative of the status as forecasted upon completing the 2018 tree trimming plan for distribution circuits, excluding subtransmission.

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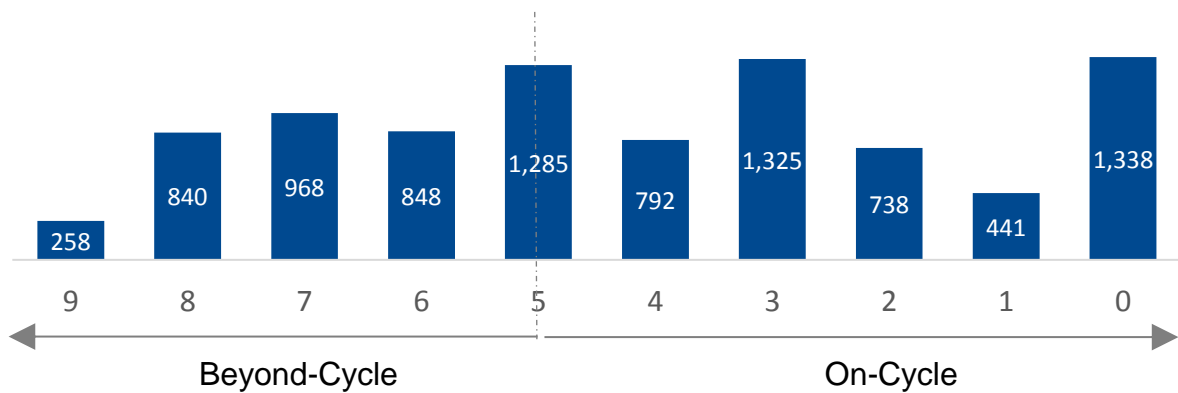
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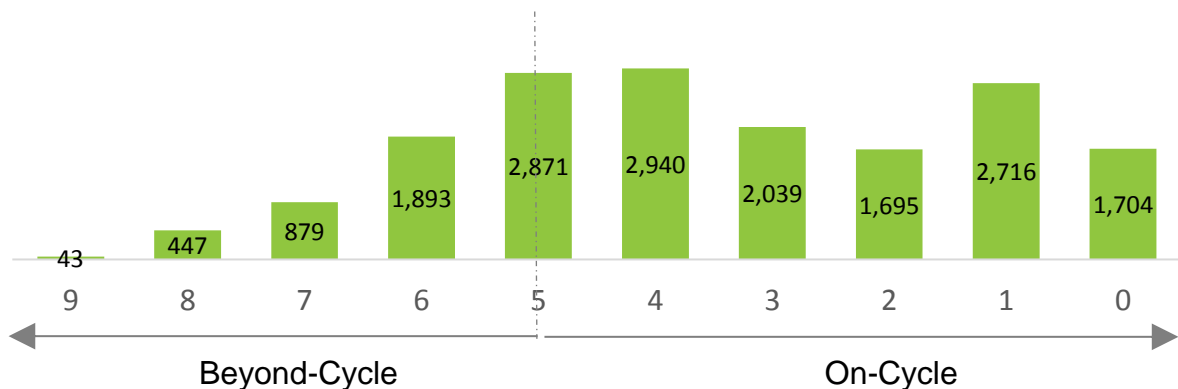
Number of Years since the Last Trim
(4.8kV miles in the City of Detroit)



Number of Years since the Last Trim
(4.8kV miles Non-Detroit)



Number of Years since the Last Trim
(Miles in the Remainder of the System)



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Request:

63. Regarding the responses to #17 and #18, the response states that “DTE was not able to identify the number of poles in each category which exceeded the 10-12-year inspection frequency.” Is this due to a lack of documentation and recordkeeping, lack of the ability to retrieve this information through the management system, or both?

Response: During storm restorations, the exact locations (geographic XY coordinates) of broken poles are not recorded. Hence, the inspection cycle of the broken poles is not readily known.

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Request:

64.Regarding the response to #23, could you please send the actual wire down response procedure(s) outlining what is required from the time the wire down is reported until the wire down is resolved? The Commission order requests that Staff provide an analysis of the strength and effectiveness of DTE's down wire procedures.

Response:

The Company will make its response procedures available for Staff's review at our Lansing office.

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Request:

65. Regarding the responses to #29 and #30, could DTE provide us information showing how many of the wire downs were not identified within 4-hours (when a ground alarm is detected)? If so, please provide. It seems like this information could be obtained through the OMS system since milestones such as the creation of wire down, dispatch time, arrival time, and the action taken by the field resource are tracked.

Response:

As previously stated 45 ground alarms and 37 ground alarms in the April 15th and May 4th storms respectively lead to the de-energization of circuits.

A downed wire may not be the cause of a ground alarm (for example, there is an equipment issue within a substation), however, if the cause of a ground alarm is a downed wire, there is no tie between the events (the downed wire and the ground alarm) in the OMS. For a downed wire to appear in the OMS there needs to be a customer, or police and fire department report of one. A ground alarm itself does not trigger the creation of a wire down event as there often might be other causes within the substation for the ground.

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Request:

66. Regarding the responses to #35 and #36, DTE did not use any wire guards for the April and May storms in 2018. Was this because none of the locations met the enhanced stand-by criteria? See attached question #59.

Response:

DTE did not use any wire guards in the April or May storms. Any location that met the standby criteria was addressed by dispatching a qualified overhead resource. See response to question 64 for further details on the Company's wire down procedures.

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Request:

67. Regarding the response to question #40, does DTE have an internal wire down relief target? Page 2 of DTE's report filed under U-16462 regarding wire down relief seems to indicate that the target was 120 minutes back in 2010. Page 3 states, "To assist in achieving this higher level of performance, Detroit Edison has set an internal goal of 120 minutes to relieve non-utility personnel standing-by downed wires." Is this goal still something that the Company targets?

Response:

The 120 minutes indicated in U-16462 is not a metric that the company currently targets. DTE follows the MPSC requirement of relieving non-utility personnel standing by downed wires within 240 minutes in a metropolitan area and 360 minutes in a non-metropolitan area 90% of the time.

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Request:

68. Regarding the response to Question #45, it appears that DTE does not track capital and O&M spend on a circuit basis. Please explain how the capital and O&M funding is allocated to ensure that the funding is equally distributed across the entire system and how DTE tracks the historical spend. See the attached request #60.

Response:

Please refer to response to question 60.